

MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

I.—BELIEF.

By G. F. STOUT.

§ 1. *Scope of Inquiry.*—Under the head Belief I include every mode and degree of assent or dissent—everything in the nature of an acknowledgment explicit or implicit of objective existence. Belief is thus for me, as for Prof. James,¹ the “mental function of cognising reality”. Like James Mill,² I apply the term to “every species of conviction or assurance; the assurance of what is before our eyes as well as of that which we only remember or expect; of what we know by direct perception, as well as of what we accept on the evidence of testimony or of reasoning”. It is, perhaps, needless to say that, from this point of view, disbelief must be regarded as a case of belief. To disbelieve a proposition is to believe its contradictory. But denial, no less than affirmation, is an acknowledgment of objective existence. The denial that William Tell ever lived is the expression of a belief about historical matter of fact. It means that the ideas which we connect with the name of Tell are incompatible with the actual course of events; or, in other words, that the historical reality was of such a nature as to preclude

¹ *Principles of Psychology*, ii. 283.

² *Analysis*, i. 343 (Note by J. S. Mill).

the existence of Tell. In addition to this, the denial of Tell's existence as an actual person is an implicit acknowledgment of his existence as a creature of imagination, a psychological matter of fact more important than the historical occurrence, which is denied. Doubt also is, in part, a phase of belief. It is belief in a disjunctive judgment. It consists in acknowledging the reality of one or other of a number of alternatives without deciding between them. Doubt is an indeterminate reference to a determinate reality. Hesitation between alternatives presupposes the implicit acknowledgment that the nature of objective existence postulates one of them to the exclusion of the others. On the other hand, in so far as the doubter vacillates between incompatible alternatives, he fails to apprehend the fully determinate reality. Doubt is, in this respect, the imperfection of belief; and, so far as the imperfection extends, it may be regarded as the contrary opposite of belief.

§ 2. *Objective Existence as the Limit of Subjective Activity.*—An object, as Prof. Croom Robertson has said (MIND, xiii. 421), is primarily an "obstacle". The apprehension of real existence depends on the limitation of our volitional activity by the material upon which it is exercised. Under volitional activity I include all modes of activity dependent on feeling. The term embraces both movements of the body, in so far as they are not automatic, and the inward process of fixing and remitting attention. I propose to discuss separately the various kinds of real existence, pointing out the mode in which they manifest their reality by prescribing limits to the range of subjective selection. The physical limitation to which we are subjected in the exercise of our practical activity has been already treated in my article on the "Genesis of the Cognition of Physical Reality" (MIND, xv. 22). A few further remarks will be made on this topic; but we shall have to consider principally the limitation of attention by the nature of the presentations attended to.

§ 3. *The Real in Sensation.*—The real as immediately apprehended in sensation must not be confounded with the reality of physical things as existing independently of the percipient mind. Sensation as such is real in so far as it limits and controls the movement of attention, by restricting the range of subjective selection. There is a very clear statement of this point in Berkeley (*P. of H. K.* §§ 28, 9):—"I find I can excite ideas in my mind at pleasure, and vary and shift the scenes as oft as I think fit. It is no more than willing, and straightway this or that idea arises in my fancy; and by the same power it is obliterated and makes way for

another. This making and unmaking of ideas doth very properly denominate the mind active. . . . But, whatever power I may have over my own thoughts, I find the ideas actually perceived by Sense have not a like dependence on my will. When in broad daylight I open my eyes it is not in my power to choose whether I shall see or no, or to determine what particular objects shall present themselves to my view." This statement in the main fairly and clearly expresses the antithesis between subjective freedom and objective coercion which is involved in the existence of sensation. It is, however, seriously incomplete in two respects. In the first place, it fails to notice the peculiar steadiness belonging to sense-impressions, and communicated by them to the other elements of the perceptual complex to which they belong. So soon as attention to an idea becomes relaxed the idea becomes almost immediately obscured. Thus, as attention is subject to rhythmical intermission at short intervals, the ideas attended-to "flicker," as Dr. Ward says, "like the flame of a gas jet". A percept, on the contrary, may maintain itself in consciousness for a considerable time with approximately the same vividness and distinctness. It possesses a fixity independent of our subjective activity. The second respect in which Berkeley's statement is inadequate is that he unduly narrows the range of the antithesis between subjective selection and objective coercion. He represents it as existing only between attention to ideas and attention to percepts. But a little consideration will show that the same antithesis exists even within the limits of perceptual attention. Even within these limits our activity is to a large extent free. We can choose whether we shall open our eyes or not. When they are open we can choose in which direction we shall look. There is a similar freedom of selection in the case of touch. In the case of hearing and smell it still exists, though it is very much restricted. In contrast with the power of the will over the muscular adaptation of the sense-organs is its powerlessness to determine the nature of the resulting sensation. Only those sensations which are immediately dependent on our own movements form an exception. If we possessed the same kind of command over other classes of impressions, then, in the words of Locke, "the eyes of a man in the dark would produce colours, and his nose smell roses in the winter".

§ 4. *The Real in Judgments of Comparison.*—In general, the process by which we search for relations of likeness and difference between objects seems to be as follows. We concentrate attention in rapid alternation now on A, now on B.

In so doing we endeavour to keep our attention as far as possible fixed on A in the very act of fixing it on B. This attempt is partly successful, partly unsuccessful. It is successful in so far as the two presentations are alike, for to that extent the act of attending to the one is identical with the act of attending to the other. It is unsuccessful in so far as the two presentations are unlike, for to that extent they resist superposition. This resistance, having its source in the intrinsic quality of the objects compared, constitutes a definite limitation of our subjective activity. In and through the peculiar movement of attention which I have described, the points of agreement and difference between A and B gradually emerge into clear consciousness. These agreements and differences are presented as objective facts, because they are presented as having their foundation in the nature of the ideas compared, independently of the act of comparison. I can choose to compare or not to compare a particular purple tint with other purple tints as well as with pure red and violet. I can also determine what degree of care I shall take in making the comparison. But when subjective selection has done its part, I have no choice left. I am compelled to admit that this purple is intermediate between red and violet, being in part like the one and in part like the other, and that it approaches more nearly to pure violet or to pure red than certain other purples with which it is compared.

§ 5. "*Objective Attributes of Presentations.*"—"Everybody," says Dr. Pikler, "believes *all* of his presentations to be possessed of duration and intensity; *all* of his presentations to stand in certain relations, with regard to time, resemblance, or difference, to all his other presentations." It is obvious that facts of this kind have a reality which does not depend on their being cognised by the individual to whose experience they refer, either at the time of their occurrence or on subsequent reflexion. "This is a species of belief in objective existence, the psychology of which has never been laid down."¹ Dr. Pikler deserves credit for his clear formulation of the problem. But I am compelled to reject his solution, which is as follows:—"If I believe that a presentation of mine has lasted a short or a long time, has followed or preceded another of my presentations, and so forth, without these facts being actually presented to me, then the meaning of my belief is that, if it had been my will, I could have had, or, to speak more correctly, I should have

¹ *Psychology of Objective Existence*, pp. 11 ff.

had, together with this presentation or those presentations, certain other presentations . . . ; that is, if it had been my will to have presented to me, or, as it is commonly expressed, to observe the durations, intensities, time-relations, resemblances and differences of my respective presentations". This view appears to be quite untenable when it is confronted with the facts. I believe that my presentations will have or have had relation of sequence and simultaneity, of resemblance and difference, even in cases in which the voluntary observation of such relations is an impossibility. I believe that my experience had a time-order before I was capable of apprehending temporal relations. I believe that a certain presentation in my consciousness resembles in quality a presentation in the consciousness of another person, although no volition of mine could enable me to compare them. My attention is sometimes so engrossed by its objects that I cannot take cognisance of the lapse of time in my own subjective experience: yet I believe on reflexion that my thought has proceeded by a series of successive steps, and that it lasted during a certain determinate period. Dr. Pikler will no doubt have much to say on this aspect of the question, in pt. ii. of his Essay, which is to treat of "*Objectiva* incapable of presentation". Meanwhile I cannot but regard the very existence of such "*Objectiva*" as constituting a serious difficulty in the way of a theory which would resolve real existence into the possibility of voluntary observation. The only plausible mode of meeting this objection which occurs to me is as follows. The sole purport of our belief in unobserved relations and attributes of our presentations is that we should have observed them if we had willed to do so. It does not include the belief that the volition itself was possible. Thus our belief in psychological facts, incapable of immediate presentation within the experience to which they refer, would on this view merely mean, that this incapability is not due to the intrinsic nature of the facts, but to the incapacity of the subject for the requisite act of voluntary attention. If we had willed, we should have taken cognisance of a certain relation of sequence or resemblance. This may be true even though we could not possibly have so willed, just as it may be true that "trespassers will be prosecuted" even though there never will be any trespassers to prosecute.

This defence seems to meet the immediate objection in the form in which I have stated it. But from another point of view it is compromising: for it brings into clear light the fundamental weakness of the whole theory. This weakness

lies in the identification of concrete and particular matter of fact with the mere logical relation of condition and conditioned in a hypothetical judgment. The reality of psychical occurrences is, according to Dr. Pikler, not merely manifested or indicated, but actually constituted, by their relation to voluntary attention. When we assert a psychological matter of fact, we mean that the subject to whose experience it refers would have been aware of it if he had willed to attend to it. We mean simply this and nothing more. We do not even imply the possibility of attending to it or of willing to attend to it. The reality and even the possibility of the antecedent, and therefore of the consequent, in the hypothetical judgment is a matter of indifference. There is, therefore, nothing left but the bare relation of condition and conditioned. This, according to Dr. Pikler, is all that the ordinary man means when he asserts a definite and particular occurrence in his own history.

It is true that a hypothetical judgment, having an impossible antecedent member, may, nevertheless, refer to concrete reality. But it can only do so by implication. It may, for instance, be an illustrative hypothesis throwing light upon the nature of some real thing. But this reality is always presupposed. It is not asserted in the judgment itself. Take, for example, the statement that, if Aristotle lived in our days, he would make an excellent editor of a series of popular science-primers. This proposition, perhaps, illustrates the bent of Aristotle's mind and the nature of modern education. But it presupposes the existence of both. So it, no doubt, illustrates the nature of the "objective attributes of our presentations" to say that they might always be observed if the requisite act of voluntary attention could be performed. But such a statement does not assert the existence of these "attributes". It merely assumes it.

Another flaw in Dr. Pikler's theory is its failure to distinguish between the phenomena which are merely observed by voluntary attention and those which are actually produced by it. The act of introspection modifies more or less the mental processes which it examines. The superinduced modifications are presented as part of the total content of consciousness, so that the psychologist has to use great care and pains in order to detach the independently existing facts which he wishes to observe from those which result from the act of observation. According to Dr. Pikler's view, this distinction is a distinction without a difference. To me this appears to be a *reductio ad absurdum*. The true account of the matter would seem to be diametrically opposed to that

which we have criticised. The reality of a psychological fact, like all other reality, is not constituted by any kind of dependence on volition—not even by that subtle and indirect dependence which is described as “presentability at will”. On the contrary, real existence, here as elsewhere, essentially consists in the manifest independence and self-existence of the object in its relation to the volitional activity through which it is cognised. It is presented as a limit imposed on subjective selection. I am, to a large extent, free to choose whether I shall or shall not observe the time-order of my presentations as they pass through the focus of consciousness. But I cannot by the same act determine what the sequence shall be. I cannot by the same act determine which presentations shall be prior or subsequent or simultaneous. To know is not to create. It is true that the act of introspection does, to some extent, alter the character of the mental process to which it is directed. But this alteration, in so far as we are aware of it, is discounted. It is not treated as forming part of the fact which we wish to observe. To reflect on our own motives is to give them a definite formulation, which increases or diminishes their power. But if we wish by our analysis to ascertain the pre-existing strength and mode of operation of these motives, we must eliminate the peculiar reinforcement or enfeeblement which they acquire by their emergence into distinct consciousness. What is apprehended as merely dependent on the cognitive act is not treated as forming any part of the real existence of the object cognised. The object as such is independent of our will. Its objectivity consists in the limitation and control which it imposes on our subjective activity. When we attend to it, we find in it an intrinsic nature manifestly independent of and antithetically opposed to our power of subjective selection. When I scrutinise a presentation, *quâ* presentation, with the view of ascertaining its attributes, I cannot but ascribe to it duration and a position in a time-series. These attributes obtrude themselves upon me with such constraining force that I am unable to think distinctly of a presentation with no duration and no position in time. Hence I believe that all presentations are of this nature, independently of any action on my part or on the part of anyone else.

§ 6. *The Objectivity of Space and of Spatial Relations.*—I do not here intend to touch the question of the genesis of the space-perception or conception. Assuming space as it exists for the developed consciousness, I shall confine myself to an investigation of the psychological conditions on which depends its presentation as an objective reality. Here also

it will be convenient and instructive to begin by examining Dr. Pikler's account of the matter. His view is most clearly formulated in the following passage:—

"We believe that, besides or in the place of the extension or portion of space which is presented to us at any moment in any of our presentations, we may through will (namely, by the motion of our eyes, our heads, our extremities, or by the propulsion of our whole bodies) obtain the presentation of another portion of space to the right, to the left, in front, in the rear, upwards or downwards, of the already presented portion of space, and then again of *other* portions of space in all the above directions from the former, and of other portions of space again, further and further without any limits. Hence, while there is present to us at any moment a portion of space, we believe that had it been our will at a certain preceding period any of these numberless other portions of space standing in certain space-relations to the presented one might be presented to us at the present moment; and we express this belief in this way, that numberless other portions of space exist, or that an indefinite Space exists at this moment, of which the portion of space happening to be presented forms part."

It is obvious that this theory of the objectivity of space, like the corresponding theory of the objectivity of psychical relations and occurrences, identifies actual matter of fact with a mere logical relation expressed in a hypothetical judgment of which the antecedent, and therefore the consequent, may be unreal. For we certainly have not an unlimited power to change our position in space at will. Apart, however, from this rather subtle objection, there is ample reason for rejecting Dr. Pikler's theory.

It is true that we are, within wide limits, free to produce change of place by moving our bodies according to our will. We may choose to move to the right or to the left, forwards or backwards, upwards or downwards, whenever we please. But this freedom of subjective selection has rigid limits imposed on it by the very nature of space. We may turn either to the right or to the left, but we cannot by the same act do both. We may pass from one part of space to another, but we cannot do so without passing through a fixed series of intermediate spaces. We cannot by any effort of ours make the diagonal of a square equal to one of the sides. Now the important point is, that it is just this control imposed by the nature of the object on our freedom which constitutes its objectivity. Our power of determining whether or not we shall move and of selecting this or that direction is purely our own private affair in so far as it depends on our volition. From another point of view we must regard even the range of our freedom as determined by the object which thus prescribes its limits. In so far as this is the case, our power to move implies the real existence of space. But, in so far as this is the case, our power to move

does not depend upon our volition. This will appear most clearly from a consideration of the conditions which cause us to believe in the boundlessness of space. These conditions are by no means sufficiently expressed by the mere statement that we can always command a presentation of change of place by voluntary movement. The essential point is that this constant possibility of transition from one position to another is apprehended as inherent in the very nature of space independently of our will. I am constrained to represent space as boundless, because I am unable by any effort of will to conceive the opposite. A spatial limit is nothing but the junction between one portion of space and another. Whenever, therefore, I distinctly attend to the nature of a spatial limit, I must of necessity admit that space is boundless. I am *ipso facto* constrained to admit that the nature of space as such offers no hindrance to an endlessly progressive movement, whatever obstructions may arise from other causes. But in all this I am purely at the mercy of the object, which obtrudes itself on me independently of my wish or will. It posits itself as boundless, uniform and homogeneous.¹

What has been said about the objectivity of space in general applies *mutatis mutandis* to the objectivity of space-relations as treated by the geometrician. Having given a scheme or rule of construction, I can carry it out in manifold ways. I may in imagination shorten or lengthen the sides of a plane rectilinear triangle as much as I please so long as I do not make any two of them together equal to the third. So soon as I do this the triangle ceases to exist and becomes a straight line. This is a limitation imposed on constructive attention by the very nature of the material on which it is exercised. Of course there are many difficulties connected with the apprehension of geometrical truths which are not touched by this account. So far as these difficulties belong to epistemology, I am not here concerned with them. I feel bound, however, to say something about the imperfection of our geometrical constructions, both mental and physical. Geometrical truths are, in the first instance, presented as limits imposed on the constructive movement of attention by which it traces geometrical figures in imagination. But we cannot in this mental experimentation construct perfect figures. I think that most of us succeed better mentally than we do on paper. But there always seems to be some imperfection in the result of our

¹ Of course I do not wish to prejudice the question as to whether space is boundless, uniform and homogeneous. I only mean that it presents itself as such to the uninstructed in transcendental geometry.

best efforts. How is it then that, being aware of this defect, we, or at least most of us, possess such an unwavering certitude of the truth of geometrical axioms? The answer to this question seems to me to be contained in the Kantian doctrine of schematism. A *schema* is, according to Kant, a certain rule of construction which we *endeavour* to observe. Psychologically, I should say that it was an apperceptive system of what I have elsewhere called the proportional or analogical kind. Such a system is a combination of ideal elements having as their principle of union a certain similarity of the relations in which they severally stand. Thus the common relation of equidistance which all the points on the circumference of a circle bear to the centre is a formal affinity sufficient to constitute the systematic unity of an apperceptive system. For the formation of a system of this kind, it is not necessary that we should ever have had experience of a perfect circle, either through our freely constructive movements, or through those movements by which we follow the outline of sensible things. If the blending of the residua of a plurality of particular experiences depends entirely upon a certain relational similarity between their respective contents, the unity of the product will be wholly constituted by this formal affinity. The irregular deviations from the typical relation in particular cases will count for nothing in the ultimate result, because they *ex hypothesi* play no part in producing this result.

Now a mental formation of this kind supplies the psychological basis of geometrical schematism. The constructive activity, which is initiated and guided by such an apperceptive system, aims at the tracing of a perfect circle. In so far as it falls appreciably short of this aim, the shortcoming is recognised, and an endeavour is made to correct it. Defects in the synthesis of apprehension are continually detected and rectified by the synthesis of recognition. Our certitude of the truth of geometrical axioms, notwithstanding the imperfection of our geometrical constructions, is, I think, in part explicable as follows. We construct according to a *schema* or rule. This rule is imperfectly carried out. But the more nearly we approximate to its realisation, the more does our constructive activity become limited in a certain respect. Thus, if I continuously diminish the length of two sides of a plane rectilinear triangle, keeping that of the third unaltered, I find that I must at the same time bring the vertex continuously nearer to the base. In and through this process I become aware that, if I make the length of the two sides together equal to that of the third, I am unable to prevent the vertex from coinciding with a point in the base.

This explanation is, however, incomplete. It does not show how I am able to fix the exact point at which the vertex will coincide with the base. To explain this we must take into account the continuity and uniformity of space and the consequent continuity and uniformity of movement. It is true that I cannot make the two sides of the triangle exactly coincide with the third if I picture them as at rest relatively to each other. But if I continue the movement of the vertex, so as to make it emerge at the other side of the base, I *ipso facto* include the coincidence of the two sides with the third as a transition-stage of the process. At the same time the triangle vanishes.

This is why I am certain that any two sides of a triangle must be greater than the third. I am not here concerned with the validity of my belief. I have merely tried to analyse the psychological conditions of my subjective certitude. These seem to me to lie ultimately in the impassable barriers, arising from the very nature of space, which confine the freedom of my constructive movement. I encounter these obstacles as I encounter the resistance of material things in the attempt to overcome them.

§ 7. *Reality in the Association of Ideas.*—Association is undoubtedly a cause of belief. If certain contents of consciousness have once been copresented in a certain relation to each other, the reproduction of the one tends to bring about the reproduction of the other in the same relation in which they were originally copresented. It is sometimes impossible to counteract this tendency without a mental effort, and the required mental effort needs, *ceteris paribus*, to be more strenuous in proportion as the association is closer. Under these conditions preformed associations offer resistance to our subjective activity. In some cases this resistance is insuperable. James Mill used the term "indissoluble associations" to designate these connexions by which the range of subjective selection in the combination of ideas is rigidly restricted. He maintained that all cases of belief are referable to indissoluble association. For reasons too obvious to mention, I disagree with this doctrine. But I do agree with him, as against his son, that cases of indissoluble association are *ipso facto* cases of full belief.

I now proceed to consider the criticism directed by the younger against the elder philosopher.

John Mill tells us that "what the author of the *Analysis* means by indissoluble associations are those which we cannot by any mental effort at present overcome. If two ideas are, at the present moment, so closely associated in our minds, that neither any effort of our own, nor anything else

which can happen, can enable us to have the one without its instantly raising up the other, the association is, in the author's sense of the term, indissoluble". In the main this is a good formulation of James Mill's view. But in two points it is, I think, capable of improvement. In the first place, the ideas need not be so closely associated that no effort of our own, nor anything else that can happen, can enable us to dissolve their connexion. The words "*nor anything else that can happen*" are unnecessary and misleading. The essential point is the limitation or constraint imposed on our subjective activity, under certain given conditions, by an association between distinguishable contents of consciousness. In the second place, it is ambiguous to speak of "one idea raising up another". To preclude misunderstanding, it would be better in a formal statement to say that, when two ideas are indissolubly associated, no effort on our part can enable us to attend to the one without its instantly raising up the other, in a certain fixed relation to itself, as part of a single complex presentation. But even this wording of the definition is, perhaps, not sufficiently guarded. Thus *a* may sometimes fail to call up *b* in the way described, and yet the association between them may for our present purpose be rightly regarded as indissoluble; the essential point is that when *a* does recall *b* we shall not be able by any mental effort to substitute for *b* any other and incompatible presentation *x* in the same relation to *a*.

Bearing in mind this preliminary explanation, let us now examine J. S. Mill's criticisms. He begins by admitting that indissoluble or, as he less happily terms it, inseparable association very often suffices to command belief. This admission can hardly be refused by anyone. If I have just heard a certain series of sounds, and I proceed to recall them in memory, my belief in their time-order may be wholly or almost wholly based on association. If I recall the sounds *a*, *b*, *c* with sufficient vividness and completeness, together with their accompanying circumstances, I cannot help believing that *d* followed *c* and preceded *e*. Of course, I am not now trying to explain how and why we believe in the reality of past time. This would require a consideration of the whole question of time-presentation. All that I mean to say is that, given a belief in the reality of past time, mere association may be sufficient to constrain us to represent an event as having a certain fixed place in a time-series. Mill's admission, I suppose, comprehends cases like these. It also comprehends cases of a much more doubtful kind—doubtful not as regards the existence of a belief but as regards its

dependence on association. Thus, as we know, he would actually trace our belief in the infinity of space to this cause.

His main contention as against James Mill is "that the inseparable associations which are so often found to generate beliefs do not generate them in everybody. Analytical and philosophical minds often escape from them, and resist the tendency to believe in an objective conjunction between facts merely because they are unable to separate the ideas." Now I think it will be found that if and so far as the philosophical minds have succeeded in overcoming the "tendency to believe" they have also acquired the power of dissolving the corresponding association by a mental effort, and that if and so far as the association remains inseparable the belief is unaltered. Let us consider some of the cases which are examined in the younger Mill's note. The first of these is "the association between sensations of colour and the tangible magnitudes, figures and distances, of which they are signs and which are so completely merged with them into one single impression that we believe we see distance, extension and figure, though all we really see is the optical effects which accompany them, all the rest being a rapid interpretation of natural signs". On this he remarks that a "great majority of those who have studied the subject believe otherwise," although the retinal picture suggests to them the real magnitude in the same irresistible manner as it does to other people. The fallacy of this argument seems obvious. There is an association between certain visual impressions and certain tactile and auxilio-motor elements forming part of the same perceptual complex. The natural man does not identify these elements as tactile and auxilio-motor, but, *ex hypothesi*, he is aware of them; and certainly if the question ever occurred to him he would believe in their presence as ingredients in his visual percepts. But, *ex hypothesi*, the scientific thinker believes in their presence also. He only differs from the plain man because he has a theory of how they come to be there. Furthermore, there is an association between the visual tactile muscular complex and what John Mill would call the "present possibility" of having certain tactile visual and muscular sensations in a certain order. This association is ordinarily indissoluble, and when it is indissoluble it is invariably accompanied by belief. As I sit writing I see a candle before me; the sight of it suggests irresistibly the present possibility of touching it by a movement of my arm, and I believe that I can so touch it. The cause of my believing that I am able to do so is that I cannot by any effort represent myself as unable, except by representing the

conditions as altered. Turning now to another example quoted by John Mill from the author of the *Analysis*, let us suppose that I look at a distant terrestrial object through a telescope; it appears nearer. That is, its appearance is similar to that which it would present to the naked eye if it were nearer. This appearance is a highly complex presentation traceable to tactile and muscular as well as to visual experiences. It may for a moment call up the idea of a real distance such as would correspond to it under ordinary conditions: it may for a time maintain this idea in consciousness in just the same relations to itself as those in which it would under ordinary conditions be presented. Precisely as long as this lasts, *i.e.*, precisely as long as the association remains indissoluble, the belief persists. In my own case the deception appears to last for at least a fraction of a second. The belief is, as James Mill says, "immediately corrected by accompanying reflexion". But this accompanying reflexion corrects the belief by dissolving the association. I come to connect the whole optical-tactile-muscular complex, which constitutes the appearance of the object to my eye, with a different physical distance.

John Mill's objection resolves itself into this: the plain man does not distinguish between the impressional and the other elements of the perceptual complex which is presented to him when he looks at an object. This is no doubt true. But it is quite irrelevant. The plain man has an inseparable association between the appearance of an object to the eye and a certain experience obtainable under given conditions. He believes that on observing these conditions he will have the experience. But the most analytic philosopher believes the same. As regards the question of psychological analysis, it does not seem obvious that the plain man has formed any association at all. If he has, and if the association is at the outset inseparable by any mental effort, it is certain that it becomes separable by a very slight effort when the plain man has become a psychologist. It would be tedious and perhaps useless to prolong this discussion. Suffice it to say here that I believe it possible to deal in a similar manner with all John Mill's criticisms in cases where association really is indissoluble.

James Mill was right in holding that a connexion of ideas which at any moment we find to be indissoluble by mental effort is at that moment a belief. But he erred in regarding this relative inseparability as dependent merely on the strength and intimacy of the association between the ideas connected. The closest association between *a* and *b* fails to enforce the combination *ab*, if this combination is opposed in any in-

stance by sufficiently powerful counter-associations. Thus we readily correct the error momentarily induced by a ventriloquist, who makes lay figures appear to speak. On the other hand, a comparatively feeble association may command belief merely from the absence of counter-associations. This is the basis of Bain's doctrine of primitive credulity—a doctrine fully borne out by all that we know of the beliefs of children and savages, and of the suggested beliefs of hypnotic patients. "It never occurs to the child to question any statement made to it until some positive force on the side of scepticism has been developed." Similarly, a suggestible patient may be made to believe that he is Julius Cæsar, or a pig, simply because opposing mental connexions are inoperative. But we are here on the threshold of a fresh topic.

§ 8. *Subconscious Conditions of Belief.*—The presentations which successively emerge into the focus of consciousness are only fragmentary portions of the total mental system. They and their connexions are integral parts of a ramifying net-work of associated elements. It follows that the strength of an ideal combination ab as presented at any moment need not depend merely on an association between a and b . In most cases the coherence of the combination ab with the total complex of associational and other connexions of which it is part, will be a far more powerful condition. Many, if not most, of our beliefs depend on the operation of subconscious elements which, in massive combination, co-operate to support a certain connexion of ideas which appears in consciousness as an object of attention. Abundant confirmation and illustration of this doctrine is to be found in Newman's *Grammar of Assent*, especially in the chapter on informal inference. The following quotations seem to me to express with admirable accuracy the psychological genesis of many of our most deeply-rooted convictions: "As by the use of the eye-sight we recognise two brothers, yet without being able to express what it is by which we distinguish them . . . so the mind is swayed and determined by a body of proof, which it recognises only as a body, and not in its constituent parts." "It is dominated by the substance and momentum of a mass of probabilities acting upon each other in correction and confirmation." On this I would remark that the words "proof" and "probability" involve unwarranted assumptions. The massive support which a belief receives from its subconscious connexions need not have any pretence to logical validity. It may depend to a great extent on preformed associations which are founded on casual and trivial connexions of ideas. It may arise from the connexion of the belief with practical

interests or æsthetic enjoyments, or with some powerful organic sensation. With the same reserve as regards this use of logical terms, I quote the following excellent statement: "We grasp the full tale of premisses and the conclusion, *per modum unius*, by a sort of instinctive perception of the legitimate conclusion in and through the premisses, not by a formal juxtaposition of propositions". Among the many good examples which he adduces I need refer only to one—our belief that Great Britain is an island. This belief is not due merely to a direct association between the idea of Great Britain and the idea of an island. Besides the fact that we have been so taught in childhood and that it is so in all the maps, we must take into account the absence of contradiction or question, *i.e.*, of counter-associations. But this is very far from an adequate statement of the conditions on which our belief depends. A still more important condition is that comprehensive and complex systems of mental connexions would become disintegrated by persistently and consistently representing Britain as joined to the Continent. "Our whole national history, the routine transactions and current events of the country, our social and commercial system, our political relations with foreigners, imply in one way or another the insularity of Great Britain."

§ 9. *Apperception and Belief*.—It follows, from what we have said concerning the influence of the general mental organisation on the stability of ideal combinations, that such combinations may be separable or inseparable according as this or that apperceptive system happens to be predominant. This is best seen in its pathological exaggeration in the case of suggestible patients. The operator calls into play a certain group of mental factors: this group has unchallenged predominance; for all other constituents of the total mental system are relatively dormant. Ideal combinations which are coherent with the suggested group are *ipso facto* beliefs, however absurd they may be in themselves. A patient to whom it has been suggested that he is Emperor of China will believe all that occurs to his mind as implied in his imperial position. He cannot by any effort of will represent things otherwise than as they are brought before his consciousness by external suggestion. He must, therefore, accept the suggested situation as real. The apparent reality of dreams is to be explained in a similar way.

Under normal conditions also the necessary alternation of different apperceptive masses produces a corresponding variation in the conditions of belief. Thus, as I have elsewhere remarked, a person's opinions under the influence of an imposing religious ceremony may differ considerably from

those which he entertains in pursuing a scientific or critical research. It is quite conceivable that a professor of anatomy, who is also a devout Roman Catholic, may pay veneration to what are alleged to be bones of saints, although his scientific knowledge would constrain him to identify them as bones of animals. Some of the examples quoted by the author of the *Analysis*, and examined by J. S. Mill, ought to be considered from this point of view. I shall refer to one only. Sailors have seen prints of a foot resembling those of a man, and the idea is raised of man making the print. When they afterwards see a monkey, whose feet leave traces almost similar, the idea is also raised of a monkey making the print; and the state of their minds, according to the elder Mill, is doubt. "First the print raises the idea of a man, but the instant it does so it also raises the idea of a monkey. Each idea displaces the other in turn and hinders it from that fixity which constitutes belief." On this John Mill remarks: "This alternation between the two ideas may very well take place without hindering one of the two from being accompanied by belief. Suppose the sailors to obtain conclusive evidence, testimonial or circumstantial, that the prints were made by a monkey. It may happen, nevertheless, that the remarkable resemblance of the footprints to those of a man does not cease to force itself upon their notice: in other words, they continue to associate the idea of a man with the footsteps." In this criticism there appear to me to be two fallacies. In the first place, it is incumbent on the critic to show not merely that an association between the footprint and a man may persist, but also that the association which persists is the same with that which existed before the opposing testimony regarding the monkey had been obtained. The sight of the footprint suggested the idea of a man as having produced it, not merely as being capable of producing it. If this latter association remains indissoluble, so does the corresponding belief. The sailors still believe that men produce footprints of that kind. But Mill might urge that, even after the conclusive testimony to the agency of the monkey, it is possible for the original ideal connexion to recur at least momentarily with coercive force. This is true. But the important point is that this possibility lasts only so long as the sailor is comparatively oblivious of the conclusive evidence connecting the existence of the footprint with the agency of the monkey. So long as the apperceptive system, which is the psychological counterpart of testimony in general and of this testimony in particular, is inoperative, there is room for the momentary belief that the man made the foot-

print. The sailor would probably say that sometimes when he looked at it he couldn't help believing it was a man's, although, of course, he knew it wasn't.

§ 10. *The Real in the Products of Constructive Imagination*.—The alternating predominance of various apperceptive systems enables us to explain what is commonly called the difference between Belief and Imagination. This seems to be hardly an accurate way of wording the distinction. For the work of imagination either imposes an illusion on the mind or it does not. In the latter case, what is imagined is also disbelieved; in the former case, it is momentarily believed. In both cases, therefore, there is a certain reference to reality. Illusion, with which we are here mainly concerned, is a temporary and often more or less imperfect belief in the product of constructive imagination; a belief depending on certain conditions which are within our voluntary control. We can to a large extent command the prompting cues of apperceptive systems. We may arbitrarily repress the operation of certain systems, both directly by withdrawing attention¹ from them, and indirectly by placing ourselves in circumstances unfavourable to their activity. On the other hand, we may in a similar way call others into play. By these means ideal combinations become possible, which would otherwise be impossible, and these combinations may, so long as the conditions are maintained, be difficult or impossible to dissolve by any mental effort. "It thus comes about that we can say such things as that *Ivanhoe* did not really marry *Rebecca*, as *Thackeray* falsely makes him do. The real *Ivanhoe*-world is the one which *Scott* wrote down for us. The objects within that world are knit together by perfectly definite relations, which can be affirmed or denied. While absorbed in the novel, we turn our backs on all other worlds, and for the time the *Ivanhoe*-world remains our absolute reality. When we wake from the spell, however, we find a still more real world, which reduces *Ivanhoe*, and all things connected with him, to the fictive status."² In general the illusions of imagination involve belief. But this belief is distinguished by the peculiarity that it can be indirectly produced or dissipated at will. In a word, it is a product of what children call "make-believe".

§ 11. *The Real as Physical Resistance*.—The limits opposed by material obstacles to the free movement of our limbs constitute a constraint imposed on our subjective activity. In

¹ I am disposed to believe that the fixing of attention on an apperceptive system is, from the psychophysical point of view, mainly or wholly a localised variation in the blood-supply of the brain

² W. James, *Principles of Psychology*, ii. 292, note; cp. *MIND*, xiv. 329 n.

the experience of the irregular interruption of otherwise continuous series of muscular sensation, which, apart from this restriction, are producible at will, we apprehend real existence. The reality, together with that of sensation as such, being communicated to the interpretations which we are constrained to put both upon sensations and their order, gives rise by a very complex process to the presentation of a physical world. I have endeavoured to deal with this subject in my article on the "Genesis of the Cognition of Physical Reality" in *MIND*, No. 57. It would be futile to repeat even in outline what I have there said. I take this opportunity, however, to consider some points in the rival theory propounded by Dr. Pikler. This theory is a special development of his general thesis—that "the '*would be*' of presentation is the '*is*' of objective existence". He differs from Mill mainly by his introduction of will as an essential condition of that permanent possibility of presentation which, as he holds, constitutes physical reality. A possibility of presentation which is not within our voluntary control is not an objective existence. On the other hand, whatever would be presented if it were our will to move our bodies in a certain way is *ipso facto* real. I shall confine myself to one objection which Dr. Pikler has himself noticed and sought to meet.

Presentability at will is a formula which applies to two radically distinct groups of cases. (1) An object is presentable at will when the voluntary movements required for its presentation are merely movements conditioning the perceptive process. (2) It is presentable at will when it can be produced by a voluntary movement which actually changes the pre-existing condition of the thing perceived. Now, in the second group of cases, it would seem that permanent presentability dependent on volition neither constitutes nor implies the objective existence of the presented content. We may, if it be our will, break a glass and so obtain the presentation of broken glass. But we do not for that reason believe the glass to be actually broken. Dr. Pikler's defence is as follows:—"The various possibilities of effects producible through our will upon the things surrounding us may be expressed by saying that these things possess certain objective properties. Nay, in certain cases we actually express them in that way. In order to feel the resistance or hardness of a thing, it is not enough to come up close to it, but we must press it; in order to feel its weight, we must lift it; and in order to ascertain its taste, we must act upon it by resolving it in our saliva. That things are resistant, hard, heavy, or have a certain taste, means that by pressing or lifting them, or by resolving them in our saliva, we are

able to obtain certain presentations." The motions or the endeavours to move, which are required in some other cases, are only more complicated. "That a certain thing is inflammable (namely, if we scrape it) is just as much an objective property of that thing as its hardness." It is scarcely needful to point out that the reference to resistance, hardness, and weight is irrelevant. The movements of lifting and pressure which reveal the existence of these properties play no appreciable part in their production. The case of taste is somewhat different. But it is not to the purpose; for we ordinarily take no account of the part played by the saliva in the process of tasting. When we do take account of it, we say that a body does not become sapid until it is dissolved. In all cases in which the presentation of *a* is recognised as dependent on a physical change produced in bodies by our voluntary agency, the fallacy of Dr. Pikler's contention is obvious. The possibility of producing such change does indeed imply an objective attribute; but this attribute never is and never can be *a*. I can command at will the presentation of a body in flames by scraping its surface. But I do not, therefore, say that it actually is in flames. I only say that it is inflammable.

Presentability at will implies existence only if and so far as the reality of the thing presented is independent of the volition by which it comes to be presented. The movements by which we bring ourselves into the vicinity of a body and by which we accommodate our sense-organs, and the use of artificial aids to perception such as telescopes and microscopes, do not as mere conditions of the cognitive process affect the existence of the thing cognised. We, therefore, regard it as a matter of indifference whether these voluntary actions are executed or not. Whatever *would be presented* if we chose to perform such acts must be believed to exist, whether we so act or not, just because our action would not produce the perceived object, but merely permit it to display its reality as independent of us. This seems to be an adequate account of what Prof. Mark Baldwin (MIND, No. 63, p. 389) calls the "memory-coefficient" in our perception of physical reality. The existence of a physical thing is primarily presented in sense-perception. The remembrance that we have perceived or the anticipation that we shall or may perceive it are logically equivalent to the actual perception. But the remembrance and anticipation have this force only in so far as they include a reference to the object as originally revealed to the percipient, *i.e.*, as having independent existence. Thus the

memory-coefficient is altogether secondary and subordinate to the perceptual coefficient. I still fail utterly to understand how dependence on our activity can *mean the same* as independence of our activity.

§ 12. *Conclusion.*—The consciousness of real existence is generated by the limitations imposed on attention by the nature of the objects attended to and by the corresponding limitations imposed on volitional movements by material obstacles. The mind is not a Leibnizian monad. Its processes are not sustained purely by their own inward momentum. They are continually being modified and controlled by extraneous conditions. Hence arises the consciousness of reality in sensation and in the experience of resistance. The same consciousness is also founded on associative and apperceptive connexions, in so far as these limit the liberty of subjective selection in the combination and separation of ideas.¹ It has another source in qualitative and relational resemblance and difference between presentations. But these conditions can operate only in conjunction with the law of conflict, which is the psychological counterpart of the logical law of contradiction. If we could represent *a* as standing in identically the same relations to *b* and to *c*, there would be no consciousness of reality as such. The psychological conditions operative in the growth of ideal combinations are even in prelogical stages of mental evolution restricted within definite channels by the impossibility of combining contradictory opposites when once they are superposed. The impossibility of superposed contraries is, as Lange says, "a trenchant blade by which in the progress of experience untenable combinations of ideas are severed while the tenable combinations persist". This is the ultimate ground of the limitation of subjective selection in the combination of ideas, and it is, therefore, the ultimate ground of all consciousness of real existence.

¹ Prof. James would object to such a phrase as "combination and separation of ideas". He says:—"There is no manifold of coexisting ideas; the notion of such a thing is a chimera. Whatever things are thought in relation are thought from the outset in a unity, in a single pulse of subjectivity." Few, I think, would at the present day call in question the general purport of this statement. But why does Prof. James give so unusual a sense to the word *idea*? According to general usage, an idea is not a "pulse of subjectivity," but a presentation, a psychological object, a *Vorstellung* as opposed to *Vorstellen*. The discoverer of the "new way of ideas" defined it as "whatever is the object of the mind when a man thinks". His followers, among whom I wish to be counted, have held to this definition with a fair degree of consistency.

II.—THE PHYSICAL BASIS OF PLEASURE AND PAIN. (II.)

By HENRY RUTGERS MARSHALL.

IN pt. i. (MIND, No. 63) I have attempted to present the evidence which leads me to the conclusion that Pleasure and Pain are determined by certain physiological relations of a general character, *viz.*, the relations between the amount of activity in, and the nutritive conditions of, the organ which determines the conscious content. It remains to examine this thesis in detail.

At the very beginning we are met by the special difficulty of physiological psychology, which looks for a physiological basis without adequate means of applying physiological experiment. The difficulty is serious enough in ordinary cases where the functioning of special organs is examined, but it is peculiarly so in connexion with our special investigation, for, as I have before noted, evidences of the very *existence* of special organs for Pleasure and Pain are entirely wanting: these states, so far as they can be said to have organs at all, seem to depend upon new activities with each change of content. All that we can hope to do, therefore, is to note on general lines the physiological conditions of the relations between activity and nutrition, which in the case of terminal organs we dimly see to be connected with pleasure and pain, and to ask whether these physiological conditions are constant whenever pleasure and pain are present in consciousness.¹

The thesis reached in pt. i., in its simplest form, is this: *Pleasure and Pain are determined by the relation between the energy given out and the energy received at any moment by the physical organs which determine the content of that moment; Pleasure resulting when the balance is on the side of the energy given out, and*

¹ There are other obstacles in our way which we must be prepared to face, but which it is not necessary to dwell upon. Nature's tendency to automatic regulation works in the individual against the continuance of extreme states, and tends to the obliteration of pains. In the race the emphasis of the advantageous and the tendency to the suppression of the disadvantageous complicate the evidence. The motion of habitual states towards unconsciousness renders the tracing of laws difficult.

Pain when the balance is on the side of the energy received.¹ Where the amounts received and given are equal, then we have the state of Indifference.

Now it is evident, I think, that this statement is not in any strict sense capable of either psychological or physiological verification: we must turn, therefore, to the data which have led to the adoption of the formula. Taking a step backward, we find that our thesis may be stated in these words: *Pleasure is produced by the use of stored force in the organ determining the content; and Pain is determined by the reception of a stimulus to which the organ is incapable of reacting completely. Indifference occurs where the reaction is exactly equal to the demand by the stimulus.* This statement, however, is purely physiological, and, to be of practical value to us, must be translated into psychological terms. In so doing it will be necessary to recur to physiological conceptions.

Each bodily organ has, as we know, a certain amount of elasticity. The lungs contain a body of fixed air which is not changed in normal expiration and inspiration, but which may be partly changed upon systemic demand by increase of rapidity or depth of breathing. The muscles can all do more than their normal work for a short time without perceptible deterioration. Carrying out the general principle under consideration, we may hold it highly probable that the average nerve *which is normally active at regular intervals* will have a certain amount of stored power which may be used if at any time the stimulus received is hypernormal for a short time: but in ordinary the balance between energy given out and received will be approximately equal. If, on the other hand, at any time the stimulus received be less than normal, the blood-supply to the nerve not being correspondingly diminished, there will result a storage of power, varying in quantity with the capacity of the nerve, tending on the whole to be largest in those nerves which are at intervals called upon to react to extreme stimuli. We should expect, therefore, to find the following psychological conditions for Pleasure:—

A content which appears normally at relatively regular intervals will tend to be indifferent. If it appear with hypernormal intensity or frequency suddenly in the course of the normal regularity, it will for a relatively short time appear as pleasurable, but this pleasurableness will soon fall away into indifference. A con-

¹ Care must be used not to make "energy" here the equivalent of "capacity to energise," which would make the statement a false one. As we have seen in pt. i., this is no uncommon error.

tent which has appeared normally at relatively regular intervals but the appearance of which has been suppressed for a time, will, when it appears, be distinctly pleasurable, and the intensity and duration of this pleasurable will be determined partly by the length of time which has elapsed since the normal appearance in consciousness, and partly by the frequency with which it has in the past been liable to suppression or to appearance under conditions of exceptional intensity.

Turning to Pain. Any stimulus of hypernormal frequency or amount reaching a nerve which has been often active should, if our position be correct, first bring into use such stored force as there is in the nerve until the amount of energy given out becomes equal to the energy received from the stimulus. If the hypernormality of stimulus be continuous, this relation would exist for a brief period only, and then the amount of energy given out would become less than the amount received, the balance in favour of stimulus increasing (if nutritive processes do not materially change) until deterioration of the nerve began to supervene, in which case the activity of the nerve would gradually decrease until it became entirely incapable of functioning.¹ In all cases the system is probably able in consequence of the fuller action to increase the nourishment-supply, and if the over-action be not too extreme the extra-supply of nourishment would be expected to bring about a condition of equality between the supply and the demand.

This, translated into psychological terms, would read thus:—

If a content which has already often appeared in consciousness appear with unusual frequency or exceptional intensity, it will ordinarily be accompanied at first by pleasure, which usually will wane until the content appears indifferent. If the hypernormal stimulus continue (except as below described) the content will become painful, and this pain will increase in amount, and having

¹ That continuation of painful action beyond limits produces more or less permanent destruction of the parts involved seems to be shown by observation. The over-worked muscle at length refuses to do its work. Excess of light blinds us more or less permanently, and continued excess of sound will deafen. Continuous over-feeding, besides its discomforts, will produce destructive action in the digestive organs. Tastes are not often allowed to continue through great painfulness, but to both tastes and smells which are disagreeable we soon become callous, that is, we become unable to obtain conscious effects through the stimulation of these organs. The most painful Emotional states due to excess of activity finally exhaust themselves and disappear in the exhaustion. The over-activity pains of Intellect disappear in mental inactivity, in sleep.

reached a maximum will decrease gradually until it disappears, but in general with it will also gradually disappear the content itself, not to reappear in consciousness for a considerable time, if ever. In some cases, however, if the content be not over-intense, we may look for a gradual decrease of the pain felt at the beginning until a condition of indifference is reached.

If our position be valid, therefore, the psychological conditions which I have placed in italics above should be traceable as laws wherever contents are fixable and are subject to variation in intensity or in rhythm of recurrence.

Before we undertake this task, however, it will be well, for reasons presently to appear, to examine a few corollaries which seem to follow from the physiological view we have taken, and ask whether the psychic states which we should expect to correspond therewith are found in consciousness.

Let us first consider certain aspects of what I in pt. i. have called the principle of "nutritive momentum". If a hypernormal stimulus cause painful action, increasing even far enough to bring about deterioration of the nerve-tissue, the result may in the long run actually conduce to increase of the capacity for action. For this hypernormal stimulus will indirectly increase the blood-supply, and, if the action be not carried too far, when rest comes there will supervene a condition of stored energy, so that upon a later application of the same stimulus the organ may be found not only ready to act, but ready to act under the conditions which involve pleasure. In fact this may happen *in the course of hypernormal activity*, if it be not too excessive. If the supply of nutriment increases rapidly the deterioration of the nerve substance may decrease and may finally cease altogether, and, as a result, the stimulus may no longer be excessive as related to the condition of the organ.

One more point. As our system tends to balance, it is to be expected that in the long run the supply of nutriment to an organ will come to be approximately equal to the call which the organ habitually makes upon the system. Hence it will result that oft-repeated activities in definite organs will render storage of force unusual and finally practically impossible, except under unusual conditions. Thus, organs which at the beginning of a series of stimulations had no capacity for storage and were unable fully to react, and which perhaps have become capable of storage and of giving up of stored force in answer to the stimulus, may be expected to lose the storage-habit, as the stimulus becomes more usual and recurrent, although retaining for a time the storage-capacity, which itself may be expected practically to disappear so soon as regularity of stimulus recurrence has become fixed.

If we translate again into psychological terms we shall obtain the following:—

Pain does not necessarily tend to bring about obliteration of its content in future psychoses; but may, in fact, on the whole, conduce to its vigorous reappearance in pleasurable form. That is, a content which appears painfully at one time may, if recurrent at a proper interval, be found slightly pleasurable, and if carried out to painfulness at this second appearance may be found still more pleasurable at a third appearance at the same proper interval. In fact, it may even happen that an almost continuously present content, if not too intense, may begin by being slightly painful, but end in becoming non-painful and even pleasurable in a small degree for a time. In other words, decrease of pain may appear before the maximum of pain is reached, and in that case the content will not disappear with the reduced pain, provided the stimulus which induces its up-coming continues, but will persist even if the pain disappear into practical indifference. If, in such cases, the content disappear and reappear at no great interval, at this reappearance it may be found to be actually pleasurable. There will, however, be a limit to all growth of pleasure-capacity, variable in different cases, and, on the other hand, recurrence, with great regularity, of the content will be accompanied by gradual loss of pleasurable-ness. The capacity for pleasure-getting, however, will continue so long as variability of recurrence exists, so that pleasure will result when there has been failure of appearance in the normal rhythm and subsequent reappearance; and pain of obstruction may ensue if the recurrence be exceptionally prevented. The increased regularity of recurrence, however, will end in a loss of the very capacity for pleasure, unless by a second movement through the same course as described above.¹

This, I take it, is the psychological statement of the effect of habit in the deadening of pain and in the production of pleasure. I think there is little need here of illustrative examples.

¹ Under the physiological view, growing callousness as to pleasure under continued stimulation is necessitated by the opening up of efferent channels implied in each reiteration of activity, this making the use of the stored force ever more difficult. On the other hand, exercise of a strong form, it will be seen, is necessary for the building-up of the basis of pleasure-getting.

The cravings would imply necessarily over-storage, and hence a preceding case of relative inaction; but we can conceive it possible that a certain time may be required for the accumulation of sufficient surplus to make the obstruction-pain evident, and in certain cases we may expect a sufficiently close accommodative action of the nourishing organs to prevent an over-charge of nourishment. Thus we may see ground for the fact that inaction (real or relative) does not always bring about the painful cravings.

The deadening of pleasure-getting through *habitual activity* is recognised in all regions of mental experience.¹ What are known as "acquired tastes" are more truly "acquired pleasure-gettings" in fields which have been painful or indifferent, and the course outlined in the beginning of the above statement is readily traceable in such cases. One point which involves important results may be worth illustrating. The reader will have noticed an implication that, apart from natural growth and the inherited capacity which that growth brings to light, increase of pleasure-getting in any special line comes only through hypernormal activity, which carries the mental state beyond its pleasurable phase and a certain way into the painful phase, which must follow with continuance of the hypernormal stimulus. The athlete must work beyond the lines of pleasure-getting into moderate weariness if he is to gain growth of muscular capacity and the increase of the satisfaction which will be found in the stronger exercise. He who is learning to smoke or trying to acquire a taste for olives, for example, must go beyond indifference to the beginning of disagreeableness if he is to gain a future satisfaction in the use of tobacco or a liking for the bitterness of the olive. In similar manner, all mental endeavour which is to bring increased ease and increased satisfaction must be persevered in up to the time when the work itself wearies.

These laws of habit, as related to Pleasure and Pain, have been deduced from physiological conditions, which seem to be implied in the hypothesis of which we treat. So strong a corroboration encourages us to look a little further in the same direction before taking up again our more direct line of argument.

Time is an essential factor in the process of organic repair. An organ, having the capacity to store force, and which has been so stimulated that this stored force has been used, will not immediately recover its capacity to act with full vigour. For each organ there will be a certain time after action has

¹ Spencer's explanation of the phenomena of habit as related to pleasurable and painful activities (*Psychology*, i. 579) may be briefly stated thus: Activities which are resisted require to be excited by an extra quantity of feeling ("commonly the fear of pain that may result from non-performance"). "But since the complex discharges through these complex channels render them gradually more permeable, the quantity of disagreeable representation of pain required to excite the actions decreases." This explanation upon indirect grounds seems laboured in itself. Moreover, it fails altogether, so far as I can see, to explain the evidently allied cases of acquired pleasures in sensation (the ordinary "acquired tastes").

ceased at which recurrent activity will be most effective. If stimuli are so applied that the action is made to recur at the exact interval of most efficient condition, and is not induced at intermediate times, we shall have for the organ involved the conditions productive of the most pleasure. It seems highly probable that here we have the physical basis of the gratifications obtained through rhythms. There is a tendency to vibration for the whole system. Music of well-marked rhythm almost invariably causes us to move some bodily part "in time to the music". As Gurney says (*Power of Sound*, p. 128): "We cannot doubt that the pleasure of rhythm is due greatly to the wide range of the nervous discharge, and also to the association of life and expansion, which especially collect around the sense of muscular movement".¹ Thus it is that we are to account for the full pleasures of the dance with musical accompaniment—of mere watching the dance in the ballet—of marching to vigorous music, &c. The same principle may be traced through all Art, so far as it is determined by successive rather than by simultaneous impression. The recurrence of definite elements, in architectural work, of order and symmetry—the vibrating flow of the poet's verse—points to the value of this principle; the application of which may indeed be carried far beyond the simple rhythms to account for pleasurable effects produced in many complex artistic productions. The recurrence of theme in music, for instance, which may be uninteresting if badly managed, gives the most intense pleasure if properly introduced. In such cases we have a feeling of readiness for the recurrence. Rhythmic consciousness, in fact, as thus viewed, appears as a specially marked and orderly species of what are called states of expectation when objectively viewed. If we are able to show, as I hope to do below, that we have found the basis of the pleasurable data of *Æsthetics*. There is also a relation of rhythm to pain. The throbbing of acute pain is well known. So far as this is not directly traceable to *pressures* of blood-supply, it is probable that it is indirectly traceable to the *rhythm* of blood-supply, which determines some rhythmical hyper-activity stimulative to the organ directly concerned in the pain-production.

¹ In the light of the able investigations in our day by Münsterberg, it is interesting to note Lewes's suggestion that "the acquisition of the power of attention is the learning how to alternate mental adjustments with the rhythmic movements of respiration". (*Problems*, &c., iii., § 158, n.)

The intermediate moments of reduced stimulation will enable the pain-giving organ to recuperate slightly, so that rapid deterioration is prevented.

The conditions which are involved in the case of Pleasure make it necessary that Pleasure should ordinarily be evanescent, as it is generally acknowledged to be. For the use of stored force implies the reduction of potentiality, except under special conditions. On the other hand, with stability of content we should expect to find Pain without such limit in time, provided the organ involved retained capacity to act at all, *i.e.*, so long as the content which is painful continued to be present to consciousness. This, too, accords with general experience. Such exceptions to the general rule as appear, I think, are explicable with no great difficulty, as due to those alterations of nutritive condition in relation to action referred to above.

Certain states of mind are determined not by the fixity of content, but by the special manner in which activities appear. If any of these states of mind seem to involve definite relations between activity and nutrition in the organs involved, we should be able to predict the pleasure-pain phase in which they must always appear. Some search in this direction will be appropriate here. We have seen that restriction of normal activities involves wide-spread systemic pain. Typical cases of such restriction are given when consciousness is occupied with our bodily cravings;—demand for exercise of muscle which has been unusually quiescent; hunger and thirst which arise when there is lack of normal food-supply; the artificial thirst which comes to the drunkard; those all pervasive demands for tobacco and for opium which the habitual user feels when he tries to break up his habit. If these are typical cases of restriction, they are also typical cases of painfulness of a wide character. The important mental state which we call Desire is closely bound to our more bodily cravings. Whatever else there may be in its make-up, it clearly involves a very important thwarting of the impulse to go out towards an object more or less vividly presented. Under such conditions we should find Desire painful, and there can be no doubt that it is invariably so. It is a complex state, however, which involves other elements than those which bring about the thwarting pain, and these other elements which involve pleasure often mask the pain. In Despair where the permanency of the thwarting of desire is emphasised, the pain appears in an extreme form. Aversion is a state kindred to Desire. It involves thwarted impulses relative to our separation from an

object, and should bring with it pain of a broad kind. This pain is always found as part of an aversion, although at times difficult to isolate from other ever-present painful elements; e.g., the painful representation of an object which will be painful if realised. Doubt and Hesitancy¹ are also general states which imply restriction, and are notably painful;² and so also Disappointment which involves the thwarting of an outgoing thought in expectation.

In what has gone before we have seen that artificial restriction of an activity which would naturally occur involves a gained capacity for pleasure-getting in connexion with this activity when it does occur. All the states which involve the removal of the restrictive conditions above referred to ought, therefore, to be pleasant,—and such we find them to be. The satisfaction of cravings, the attainment of desires, the fulfilment of expectations are notably delightful. Give the ideal fulfilment of expectation instead of the obstruction of non-expectation with desire and we remove the excessively painful state of Despair, gaining Anticipation which is a very full pleasure. Even where there is a vibration between expectation and non-expectation—i.e., when after Despair we have Hope only—there will be a return of activity which should involve considerable pleasure immediately followed by non-expectation, painfulness. We find Hope one of our most emphatic emotional states, as they are commonly called. This is due, I think,

¹ Cp. W. James, *Psychology*, ii. c. 26.

² Prof. Sidgwick in his *Methods of Ethics* (4th ed., pp. 182 ff.) says that he recognises "cravings which may be powerful as impulses to action without being painful in any appreciable degree". He actually speaks (p. 185) of "the neutral excitements of Desire, Aversion, Suspense, Surprise". Concerning surprise I have a word below. Here I must be allowed to say that I cannot see how a "craving" can be held to be powerful as an impulse to action without being appreciably painful. As I analyse such states of mind, the so-called neutral excitement which makes the fulness of such states is in mental regions apart from the "craving". With certain of our most powerful cravings, for instance, there are the general conditions of high activity which joy implies—there are certain emotional elements of unrestricted love—and these and kindred states we must carefully eliminate in the consideration of the craving proper. The man who hungers gets an impulse to activities from his painful craving, which activities may so far absorb attention as to cover the craving itself entirely. To understand how Desire, Aversion, and Suspense can appear as neutral excitements to any man, requires the postulation of a degree of "philosophic calm" which has lost Desire in that "apathy" towards which the Greeks aimed, which has displaced all fear by an almost fatalistic trust, and which has learned to feel that, whatever the outcome of doubtful conditions, that outcome must be good.

not so much to its true emotional elements as to the large total effect of Pleasure and Pain involved in the state as above described. Why we always tend to call Pleasure-Pain qualities emotional, I have tried to show in my article (MIND, No. 56) above referred to. Where aversion is involved, pleasurable relief is obtained by a loss of expectation. The attainment of an expectation after a temporary disappointment, even where the pain of disappointment has failed to come into notice; the settlement of Belief after the conflict of Doubt; the Will-act after the strain of Hesitancy;¹—all have connected with them such wide pleasure as we should, *a priori*, expect to find. The delights of Liberty after Restraint are proverbial.

We have been dealing above with the indirect pains caused by restriction and with the pleasures attained by normal action after unusual rest. If we turn to the pleasures and pains connected with hypernormal activity, we are able to take broader ground.

Attention, from our point of view, may be considered as determined by relative hypernormality of action in the organ involved in the production of the content attended to, the relation to the co-existent activities making up the background of consciousness, out of which the content which is attended to arises. Such hypernormality of action under our theory implies pleasure or pain except at the time when pleasure passes into pain, and then it implies a condition of neutral excitement. Attention is so frequently pleasurable or painful that Dr. James Ward, as we have seen in pt. i., has based his theory of Pleasure-Pain directly upon its effectiveness. It cannot be doubted, at all events, that all states of Pleasure-Pain are states of unusual attention, the more intense the former the stronger the latter. Question arises, however, when we consider those cases of Attention which are claimed to be neutral for long periods, and therefore apart from the momentary neutrality obtained at the moment of passage from pleasure to pain, referred to above. Considerable discussion has appeared not long ago in MIND on this subject under the somewhat misleading title "Feeling as Indifference".² Prof. Bain takes strong ground in favour of these neutral states of attention or "excitement" as he calls them. Personal introspection leads me to agree with Mr. Sully that these states of attention are really widely, but dimly, pleasure-pain toned. They often become

¹ Cp. W. James, *Psych.* ii. 529, 30.

² MIND, Nos. 48, 49, 50, and 53.

suddenly markedly painful, and this implies that they were previously slightly painful, even though not so recognised. Where excitement seems great and still not notably pleasurable or painful, I seem to note in the state a continuous shifting of ground—new contents in succession, vivid in many cases but without stability of pleasure-pain phase. This shifting of content is indeed implied in the common-sense meaning of the word "excitement". Surprise, which may be called *par excellence* the Emotion of effective Attention, and which Prof. Bain thinks a good example of indifferent excitement, appears to me to present, on the contrary, a distinct corroboration of the position here upheld. For certainly Surprise gives a pleasurable element to the ludicrous, and the general delight in surprises is indicated by the crowds who are attracted to the pantomime and the circus by the satisfaction they obtain in mere clownish novelties.

The mention of novelties turns our attention to another corroboration. Apart from the emotional surprise-component which is not always present, Novelty in most cases implies a shifting of content to regions which have not lately been prominent and therefore the activity of well-prepared organs, the use of stored force. The pleasures of novelty could have been looked for on *a priori* grounds if they were not forced upon us.¹

Coupled with the pleasures of variety go those of Unity. The emphasis of a common bond between two co-presented objects implies the action upon one organ of stimuli from two separate sources—that is, a hypernormal action in the organ determining the unity. If this organ has been well nourished we should expect the result to be pleasurable; and such we find it to be in a large body of cases. But in many cases of such conjunction of activities, of course, the amount of available force stored up must be small, and we ought to find, as we do, many unities which give us no noticeable pleasures.

General conditions of organic vigour imply conditions of storage, and hence pleasure in Activity when it arises. This is recognisable as to general physical activity, and in the more delicate regions of consciousness covers those so-called

¹It is to be noted that varieties may become non-pleasurable and even painful. The excessive action which they imply for the system at large should after a time bring general exhaustion and pain. We find ourselves "tired" of ever recurring newness, and longing for rest. That this general exhaustion is the cause of the disagreeableness, is evident from the fact that when we are very tired of variety we find any stimulation disagreeable. We seek repose from *all* stimulation.

cases of spontaneous activity (*i.e.*, action produced by stimuli, so small in degree as to be unrecognised) which are always pleasurable.

Let us turn now to consideration of states involving Fixity of Content. It will be impossible here to give more than a sketch of method and a few instances. To the difficulty resulting from lack of common agreement as to the analysis of mental states is to be added another equally formidable, and one that especially affects our consideration, *viz.*, that the acceptance of the general Pleasure-Pain theory which I defend necessarily implies a considerable rearrangement of mental phenomena in classification, and such rearrangement, of course, cannot be attempted here.¹ As debatable ground must be avoided, omissions which might otherwise be inexcusable may be pardoned. Here the Pleasures of Rest and Relief and the Pains of Restriction will require little attention. For although, as we have seen, they are only for convenience classed apart from pleasures and pains of activity, this special detachment arises from the very fact that the contents of which they are qualities are so shifting and indefinite that we are able to study them only on the wide lines of systemic functioning. In all mental fields, whether Sensational, Emotional or Intellectual, rest after high degrees of tension is pleasurable, and restriction of functioning of which we are capable is painful, in the wide way already described. We shall give our attention, therefore, to the pleasures and pains of active functioning.

If conditions alter or are alterable so that without change of content the relations between activity and nutrition vary, or may be made to vary, we should be able to note corresponding changes in pleasure-pain phase. Fixity of content on its physiological side implies the functioning of the same organs during the time of the continuance of the content. Increase of the intensity of a content therefore implies relatively increased activity of organic functioning,

¹ As an example of this difficulty it may be noted that Prof. Bain treats of certain "Emotions of Intellect". These except so far as they are reducible to Emotions elsewhere discussed by him (*e.g.*, Surprise) turn out to be simply pleasurable or painful conditions. We find it impossible to look upon an emotion as a mere complex of pleasures or pains, and therefore such a classification requires revision from our standpoint. There may be difficulty in deciding whether Anger and Pride are pleasurable or painful, but their emotional character remains. Take away the pleasure and pain from the intellectual state, however, and the "Emotions of Intellect" disappear. This seems to me to argue conclusively against Prof. Bain's classification in this particular.

and this involves changed relations between the amount of action and the capacity of the organ for action. We may therefore rightly demand of our theory some information here.

The examination is greatly aided by one implication of our general theory, *viz.*, that if we can discern laws relative to Pleasure-Pain phases by the study of some one region convenient for examination, we should be able to find traces of the same laws in other mental regions. Clearly, we must begin with Sensation, where as nowhere else we are able to alter at will the relations of activity to nutrition. The study of sensational functioning undertaken with great fulness for other psychophysical purposes has led Prof. Wundt to formulate a law as to the relation of pleasure-pain to increasing intensity of sensational content.¹ He finds that increasing intensity of sensation is accompanied by a rapid increase of pleasure up to a maximum, then by an even more rapid decrease to a point of indifference, and beyond that is accompanied by an increasing pain. This law certainly stands the test of general observation, but requires consideration because of its implicit denial in the assertion occasionally met with that some sensations are painful however low be their degree of intensity and others pleasurable however high it be.² To this we shall return after having considered certain other points.

Let us now take again the standpoint occupied in the beginning of this part.

1. As we have already seen, an organ may theoretically have capacity to act which is exactly and only equal to the demand involved in the stimulus that comes to it: and such may be held to be the case where the stimulation to activity is constant. This exact constancy, however, is probably seldom, if ever, reached. On the other hand there will often be a near approach to this equality, and with organs habitually acting to what seem constant stimuli, or to those of regular and rapidly recurring rhythm, we should expect to find a wide region of activity very close to this theoretical equality and vibrating on either side of it.

2. The inconstancy of environmental conditions, however, makes it probable that for the great mass of organs, even where this approach to equality appears, there will be suffi-

¹ *Phys. Psych.* (3rd ed.), i. 511; cp. his diagrammatic representation. Also corroboration by Jas. Ward, *Enc. Brit.*, art. "Psychology"; Horwicz, *Psych. Analysen*, iii. 22.

² Cp., for instance, Spencer's *Psych.* i. 272 ff.; also Gurney, *Power of Sound*, p. 4.

cient inconstancy of stimulus to bring about *some* capacity for storage of force however small, and hence capacity for the use of such stored force upon occasion, even though this use may be possible for a very short time only. This storage-capacity will vary in amount somewhat in proportion to the variability of the stimulus and to the importance of vigorous action whenever the stimulus occurs.

3. Whether this capacity for storage exists or not, there is no case in which it is impossible to conceive the conditions existing where the amount of energy involved in the stimulus will be greater than the amount involved in the reaction thereto.

4. All organs which have capacity to and do store force must do so by virtue of a regular or spasmodic supply of nutriment in excess of demand; hence, if the normal action of such organs be restricted, there will at first occur storage, and, when its limits are passed, then obstruction of the processes of nutritive absorption and consequent excessive action widely distributed in those organs producing the movement of nutritive currents. Inherited manner of growth may bring capacity for storage and increased nutrition to make storage possible, even before any distinct action has brought about the call for nutrition.

5. Action occurring after such obstruction will bring about the liberation of more energy than is brought by the stimulus, or, in other words, will use stored force, and this usually in proportion to the amount of the previous restriction of activity.

6. The use of stored force will also occur at the beginnings of hypernormal activity after normal conditions: the amount of stored force, however, occurring without abnormal restriction will not be relatively large, hence in such cases will be soon used up.

7. Stimuli which involve more energy given than can be reacted to, if continued, will not be followed by a reverse condition, unless in abnormal cases there be a sudden inflow of nutriment. On the other hand, where stimuli involve less energy than that of the reaction, and are continued, the disproportion will decrease as the stored force is used-up, and then the relation of energies will be reversed, as we shall see below. Where the action of stimulation is greater than the reaction, a reduction of intensity of stimulus may bring the two into equality; but, unless the stimulus is discontinued and rest supervenes, or a sudden increase of nutriment take place, there can obtain no condition where the reaction is greater than the action of stimulation.

8. If an organ be acting approximately in amount just up to its capacity, increase of amount of stimulus will involve the use of such stored force as it has (which, of course, may be practically nothing). After this has been used so far that the energies involved in both stimulus and reaction are equal, continuance of the hypernormal stimulus will involve conditions where the energy involved in the reaction will be less than that involved in the stimulus; and as the hypernormal stimulus continues or increases, the over-proportion of energy involved in the stimulus will increase rapidly.

Let us translate what has gone before into psychological language, and at the same time look for correspondence with facts of experience:—

1. *Indifference: A state which is neither pleasurable nor painful is theoretically possible, but, strictly speaking, will probably be seldom reached. On the other hand, a condition, varying so slightly either towards pain or towards pleasure as to be practically indifferent, will be very often reached, and, in fact, will be normal for most states of consciousness, which are determined by systemic activities.*

Of Indifference, in general, enough has already been said. The fact of Indifference is acknowledged in the mere statement of the problem. The real question at issue is whether Indifference is a special state of mind of wide extent, and which excludes pleasure and pain; or whether it is a quality determined by those nicely balanced conditions which are intermediate between those productive of pleasure and those productive of pain. I do not see that experience denies this last statement to which our theory would force us. One thing, at least, is certain as regards the matter of Indifference: the phase discoverable in Sensation is traceable throughout all mental regions where there is fixity of content. There are Emotions, as we have seen, which are so usually indifferent as to lead to the claim that they can never appear otherwise. Our normal life of thought is often apparently totally devoid of either pleasure or pain.

2. *Apart from the theoretical indifference above referred to, any content may bring pleasure under proper conditions, although the pleasure may be of very low degree and of very short duration. The capacity for pleasure-getting in connexion with any special content will depend upon the variability of the appearance of the content in consciousness and upon its importance in the life of the individual.*

Any Sensation can be felt pleurably if the organ involved be well rested and the action be not too suddenly

increased. If some sensations appear to be disagreeable even at their lowest intensity, it is because we cannot easily induce the action at a sufficiently low degree for experiment, attention being retained; or because the conditions of storage in the organs involved are inappreciable in consequence of the constancy of stimulus.

It is, of course, impossible to apply experimental conditions to show that pleasure is possible in connexion with action in *all* organs. We must content ourselves when we have noted that many states of common occurrence, which are supposed to be always painful or indifferent, may, if properly conditioned, be pleasant. The ordinarily indifferent rhythms of breathing are made pleasurable at the moment of increased activity when we move with vigour. Any spark of light is pleasant after some moments spent in the darkness of a mine. After complete silence any sound delights the ear, entirely apart from implications of the sound. I remember once to have been aroused from serious thought in a railway journey by a delicious odour, and the words, "What a delightful perfume!" were actually formed in thought. Almost immediately the smell changed to disagreeableness, with growing intensity, and there appeared evident the nauseating smell emitted by a skunk killed by the train. A surgeon, who has given much attention to the surgery of the foot, told me incidentally that he had noticed the odour from a well-cleansed foot to be actually pleasant, notwithstanding the extreme disagreeableness of the odour when strong.

Fear is generally looked upon as a most painful state. It can, indeed, with difficulty, be separated from spasmodic painfulness. If, however, we pay close attention to the muscular components of fear, which are the special psychic elements which fix the state, I think it not impossible to trace it in a pleasurable phase. Let one walking in the darkness and hearing footsteps behind him *deliberately* quicken his pace, he will catch the beginnings of the marked components of Fear, but not unpleasantly. There is a well-known fascination which leads boys and men to go as near to dangerous things as they dare, and then flee from them. Fascination implies pleasure-getting out of the performances involved.

Hatred-Anger are usually looked upon as painful, so much so that Prof. Bain has felt it necessary to argue at length that there are pleasures obtained through malevolence.¹ I think his position in this regard cannot be gainsaid.

Most thinking, it appears to me, is mildly pleasant.² Where it is indifferent or painful we divert our thoughts: that is, we restrict the appearance of a given content, which has become too constant, so that when it arises naturally after a time of rest the pain is gone, and we grasp the thought as we do only when we are gainers of pleasure.

3. *There will be no case in which a content cannot appear in painful phase if the intensity of its presentation be sufficiently great.*

I know of no sensational experience which, even if

¹ He has on his side Aristotle (*Rhet.* i. 11) and Plato (*Philebus*).

² Cp. Sidgwick, *Methods of Ethics*, p. 125, in corroboration. Von Hartmann, it must be noted, holds that the relation of two ideas seems to be absolutely indifferent up to the line where the intensity of the *Vorstellung* becomes so strong that pain ensues (*Aesth. seit Kant*, 289).

pleasurable normally, cannot be experienced disagreeably if intensity be increased or prolonged. What is more, there are many sensations very nearly indifferent as a rule, and scarcely traceable in pleasurable phase which may appear painful in the extreme, under serious over-exercise.

The conscious states connected with the intestinal activities are so far indifferent that they are out of attention until some time when subject to excessive stimulation they give excruciating pain.¹ We gain here an explanation of those cases of disease which bring pain in regions in which we otherwise appear to be without sensation. In normal health these organs work in a reflex way with indifference, and so far as their concomitants come into consciousness at all they do so merely as part of the background of our mental life. They have no power to store force, so that under hypernormal stimulus they at once bring about a phase of pain. Mr. Spencer, as already noted, has taken the ground that there are certain sensations, such as sweetness, which can never be disagreeable however intense they are. It may be that certain tastes which are usually pleasurable are so identified in name with the pleasurable quality that the observer will fail to use the same term in describing the painful phase of the same content. But Mr. Spencer's illustration is not a happy one. Sweetness, if intense, is exceedingly disagreeable to some people within my experience, and even I, who am ordinarily fond of sweets, find no difficulty in obtaining pain from an excessive stimulus in this direction.

Turning to other than sensational fields : Joy is looked upon as a typical state of pleasure-getting, and justly so. But for all this usual connexion with pleasure, excess of Joy brings an exhaustive pain from which often the name Joy may be altogether detached, although "a joy which is almost pain" is a recognised state. Love is thought of usually as pleasurable, but its enforced continuance brings satiety-pain, and, like all pains, induces aversion. Thus the wisdom of instinct and of racial habit makes it usual for those who love to avoid absolute continuance of companionship. And looking beyond Emotion, we see that any content of Thought if steadily presented with intensity becomes painful. Thus Mrs. Browning in one of her sonnets says :—

"Oh, entertain (cried Reason as she woke)
Your best and gladdest thoughts but long enough
And they will all prove sad enough to sting".

If we step beyond the normal we may instance the severe pain connected with those morbid cases of *idée fixe* which seem to present the typical disease of Attention. In cases of excessive weakness caused by illness, or in cases of depression of circulation, such as occurs with sadness, we should expect the organs of thought to be in poorly nourished condition. Under just such circumstances we find it painful to think ; we naturally allow the movement from image to image without attention. Any thought which involves attention we find painful. And so when we have been for a long time mentally active. The tiredness is hard to define, difficult to isolate, but we find this certainly, that the painful tiredness comes with thought in the direction in which we have been active. Thus we find that change of direction of thought is

¹ Cp. on this general subject Mantegazza, *Physiologie de la Douleur*, pp. 109 and 110.

ordinarily efficient to remove the pain. Still in cases where the activity has been long continued, where we may presume that the surplus energy has been in general exhausted, we find, as we should expect, pain in thinking in general, which can only be relieved by total rest from thought.

4. *In proportion to the pleasure-giving capacity of a content there comes into existence a wide pain if this content's appearance in consciousness be abnormally restricted. Broadly painful states which indicate capacity for special activities may arise at times before the special activity has been stimulated or experienced.*

The teaching here (1) is, that any pleasure which has been experienced may be craved;¹ and that in general the strength and pain of the craving is proportionate to the amount of pleasure which it is possible to gain in any special direction.

In Sensation this requires no illustration; nor in Emotional or Intellectual activity, if we acknowledge the essential bond between craving and desire. Even in cases where pleasure-getting is weak we experience cravings. Children and the less intellectual of men crave the experience of anger of a low degree, and hence probably the beginnings of the simulated anger of games among children and the contests of men; the represented delights of triumph being secondary. The craving to experience the stimulus of fear leads to the braving of dangers, where there is no incentive in imitation or applause. Surprise is craved notably by children. The thinker whose habit of attention to his thought-sequences is interrupted finds himself experiencing very much the same indefinite uneasiness which the active man feels after prolonged muscular restraint.

We learn (2) that cravings may arise apart from their known object— indefinite longings for what one knows not, the outcome of restriction in nutritive courses which are urged to activity by stimuli too dim to be recognised and are connected with the natural processes of inherited growth. Notable instances are those vague feelings of physical uneasiness which are the common experience of both sexes when they reach the age of puberty. Cravings, desires imply capacity to act effectively and with pleasure, and this brings us to our next point.

5. *All appearance of contents occurring after such restriction, as has just been noted, will be pleasurable in some degree, and usually in proportion to the degree of anterior cravings.*

That is, all satisfactions of cravings and desires are in themselves pleasurable, and the vividness of the pleasure gained

¹ Kant held that what has Interest must be considered beyond the field of Æsthetics, and based his theory upon the fact that Interest always has relation to capacity for desire.

is in general proportionate to the strength of the craving or desire which has preceded. I think there will be no question raised as to the validity of this law in its widest range.

6. *All beginnings of vivid appearances of contents which have been before present in consciousness will be pleasurable in some degree (excepting the narrow region where pleasure-capacity is practically lacking); though the pleasure will be of short duration unless there has been a previous time of non-appearance. This necessarily carries with it the implication that pleasure is not always determined by antecedent artificial restriction of rise in consciousness, but may be determined by simple increase of intensity of content.*

Pleasure is not always mere satisfaction of desire, as has been so often held. All use of stored force will bring pleasure even if the elements brought into action have not reached the limits of storage and have not brought craving-pain.

Our ordinary sensory field as it appears in consciousness has, it seems to me, the slight balance in favour of pleasure which comes with such beginnings of activity. Our senses are constantly changing the scope of their activity in small ways, and with the change comes slight pleasure. Apart from our sensations, which are determined directly by environmental stimuli, the great mass of our conscious states seem to me to have this slightly pleasurable tone where they flow easily and are not forced through habits of attention.¹ Spontaneity (so-called) under this theory implies pleasure: and I think common observation bears me out in this respect. Wide fields of low-grade pleasure-getting thus reached form the groundwork of *Æsthetic* effects; although cravings and their satisfactions are used as making centres of interest (note, *e.g.*, the use of discords and their resolution in music). I think it can be shown that the characteristic result in *Æsthetic* work of high quality depends on (1) production of a background of pleasure by movement over varied fields where faint pleasure is possible, (2) the use of this ground as the setting for pleasures rendered vivid by the production of storage-conditions, (3) the bringing into use of the capacities thus made possible just at the moment when the maximum capacity for pleasure has been reached and before the pain of craving has begun to accrue,—although, as noted above, the production of this very craving is allowed as the certain mark that the pleasure will be felt at its maximum.

7. *Apart from certain very exceptional cases, contents, if painful, will not become indifferent nor pleasurable if their intensity continues or increases. On the other hand, if a content be pleasurable, continuity or increase of intensity will result in decrease of the pleasure until it reaches indifference and is replaced by pain. In a great majority of cases reduction of intensity will reduce pain to indifference, but never into pleasurableness unless the*

¹ Cp. again Sidgwick, *Methods of Ethics*, p. 125.

content disappears (positively or relatively) for a time from consciousness.

Once in a while we experience slight active pains which without change of content turn into pleasures of low degree without perceptible reduction of the stimulus. "We get used to the pain," we say. Such cases remind us of the "second wind" which athletes tell of, evidently produced by the starting-up of nutritive conditions which are in excess of the demand, and which therefore not only build up the wearied nerve, but place it in conditions to react in higher degree than the stimulus demands. Many methods in therapeutics aim to break down acute pain by supplying additional nutriment to the affected organ rather than by attempting to reduce the cause of excessive stimulus. Such cases of pain-reduction without reduction of the intensity form however the exception which makes prominent the rule that we must decrease activity if we are to decrease the painfulness of the content presented. The reduction of painfulness by the process of intensity-reduction may bring us to the point of indifference, and the reduction of intensity may be such as to involve the disappearance of the content from consciousness, but mere reduction of intensity cannot normally bring about effective activity and the attainment of pleasure which goes with it, unless there has been a period of rest—a period of disappearance of the content involved.¹ That continuance, or even mere increase, of intensity where we are getting pleasure eventually brings reduction of that pleasure; also that reduction of intensity where we are gaining pleasure reduces the pleasure,—are conclusions involved in our theory, and the commonplace acknowledgment of this is found in the general and unquestioned recognition of the evanescence of all pleasure. This requires no illustration.

8. *Increase of intensity, where a content is indifferent, may at once produce pain, but normally it will at first produce pleasure, which may last but a moment and be scarcely traceable, and which in any event will rapidly disappear, if the increased stimulus be continued, until indifference be again reached, when it will begin to be painful, and this pain will rapidly increase.*

The last statement covers the ground of Wundt's law, to which reference is made above, as I interpret it. I think its truth cannot be challenged. As here stated, it appears only

¹ This is in thorough accord with the facts which, as we shall presently see, Prof. Sidgwick presents as an objection to Wundt's law, *viz.*, that certain sensations remain disagreeable under reduced intensity until they become indifferent and then vanish.

as the partial application in the circumstances most often met with, of a simpler law of wider import.¹

We shall find, I think, various other positions incidentally proven in the points which have been already made. That, in cases where the capacity for pleasure is non-existent or of very low degree, an immediate change from indifference to pain will occur is evident under our theory, and is illustrated under point (3): the normal course, however, is as Wundt states it. That in all cases likely to become subjects of attention there is some capacity for pleasure, we have seen in discussing point (2). That increased intensity of stimulus will in ordinary, therefore, bring the content from indifference into pleasure-phase was shown in discussing point (5). That this pleasure-getting, so far as it is at all possible, will rapidly increase with increased intensity of stimulus is an implication of our theory, and a fact which I think will not be denied. To increase a pleasure obtained in action in any mental region we always increase that action.

¹ Prof. Sidgwick, in *Methods of Ethics*, p. 182, has incidentally denied the validity of Wundt's law, as he understands it, thus: that all disagreeable odours and flavours may be made positively agreeable by diminution. "I find," says he, "some disagreeable until they become indifferent and then vanish." But Wundt's law, as seen from our standpoint, refers to the *increase of intensity*, and means that, if under such increase the stimulus is not too high in degree, in the rise from indifference pleasure will be noted before the advent of pain. Furthermore, our view, as stated above immediately before the deductive statement of Wundt's law, would show that *decrease of a stimulus which was giving pain* could not (except in very exceptional cases of increased nutrition) do anything but produce sensations which would be "*disagreeable until they become indifferent and then vanish*".

Before leaving this matter, I cannot help calling attention once again to the errors involved in the ordinary way of looking at pleasure-pain phenomena. Prof. Sidgwick's positions would scarcely have been reached, I think, had he not been imbued with the general notion of modern psychology that feeling is a form of mental experience *sui generis*, involving, perhaps, action in special brain-seats; for how else can he hold it to be an objection to Wundt's law, referred to above, that "pains of shame, disappointed ambition, wounded love, do not appear to be distinguishable from the pleasures of fame, success, reciprocated affection, by any degree of intensity in the impressions or ideas accompanied by the pleasures and pains respectively"? The implication of Wundt's law in this connexion, in my view, would not be that the difference as to pleasure or pain in these regions of various content implies difference of intensity, *per se*, in relation to some general standard of intensity, but that, if the content does not alter, changes from normal condition ought to cause the appearance of the content in other pleasure-pain phases than such as are normal. Thus we should look for pleasure in shame, ambition, and love (well known), and for pains in fame, success, and sympathetic attachment (less known, but, I think, traceable).

But too well do we know that we cannot increase pleasure indefinitely by this process. As we have seen in discussing (7), the increase of pleasure soon reaches a maximum, and then begins to decrease until we reach a state of indifference. After a period of indifference comes pain, increasing indefinitely till exhaustion brings entire disappearance of the content.

This course, discovered in Sensation, appears through all regions of mental activity *where the content does not change*; a point which must be kept constantly in mind in such introspective examination, for, automatically, we tend to shift our field as soon as pain begins to be felt. Our consciousness reaches out naturally to new contents which do not involve pain, unless there be a continuation of stimulation from without, which compels the continued attention upon the same content. This fact makes it very difficult to trace the change of painful intensity in states not due to external stimuli, which we are able to govern. In Emotional life we have a corroborative example in Fear, which, when continuous and extreme, ceases in exhaustive inaction, even though the object of fear still be present. The same thing is exemplified even in the higher regions of complex Thought. The most reliable corroboration here is found in the morbid continuance of *idles fices*, which certainly become painful enough, and remain so as long as they are able to hold themselves in consciousness. In general, the influence of *excessive* action is recognised in the painfulness of extreme intellectual effort. But with such mental states, we must confess that corroborative evidence cannot reach very far.

Let us now proceed by another method. In an indirect manner we may gain corroboration which approximates to the test of experiment, by examining those means adopted for the avowed purpose of gaining pleasures and avoiding or lessening pains.

All men seek pleasures, and, where the search does not bring them naturally, endeavour to produce them artificially. We ought to find, therefore, that the steps taken to procure *pleasure* are such as will increase the use of stored force. We have learned in the guidance of our children to give them unusual rest before taking them to gatherings where prolonged pleasure-seeking is attempted, and we ourselves tend to take the same course. The use of well-rested organs is the basis of the pleasure-seeker's universal search for *novelty*; not absolute newness, but new arrangements of activities which have been customary, but not lately repeated; restoration of stimuli which for some time past have not acted upon us. I think it can be shown also—but the task cannot be undertaken here—that the delights obtained in the repartee of wit are in the main explicable as due to the repression of the suggestion of mental fields, well connected with those primarily empha-

sised, until the former are most fully prepared for attention : these then, when brought into consciousness, appear with full flow of pleasure. This principle of artificial rest is of constant occurrence in the production of æsthetic effects, for example, in the principle of contrast ; but discussion of such points would lead us too far from our argument, and must be reserved. Another common method of producing pleasure by artificially increasing the capacity of organs appears in the pleasure-seeker's deliberate excitation of the general action of the nutritive system by alcoholic or other means, so that the ordinary stimuli of our habitual environment will produce exceptional reaction. On the side of hypernormality of stimulation it may be noted that the pleasure-seeker always tends to excesses. Thus he seeks out excitements which involve all his powers of intense attention in certain directions for a limited time, and again between these periods of excessive attention turns to the principle of rest, to small talk, or perhaps to eating sweets—a habit of theatre-goers, which, Aristotle¹ tells us, was common even among the Greeks when they found the action palling upon them. The delight with which the jaded pleasure-seeker turns to puns and sensuous if not malicious story-telling is familiar to all : and this species of delight is explicable, I think, as due to a sudden change of mental activity from channels where effort is required to complete the flow of thought into others well prepared for activity, *and in which a relatively small stimulus produces great proportional effect ; or, in other words, in which the amount of energy involved in and transferred from the first mental field produces much more than normal stimulation in the second field.* This is the principle of the Ludicrous, which cannot be elaborated here.

We have learned that the man who by over-work has lost all interest in things, all capacity for enjoyment, has exhausted his system as a whole, and needs entire rest if he is to regain this lost interest. We have learned that loss of interest in one special line of activity is to be regained only by working in new lines, to the exclusion of the one in which we have over-worked.

It thus appears that we are able to produce Pleasures artificially by producing the conditions of pleasure which we have described. How is it in the matter of Pains ? It is certainly true that the pleasure-seeker who depends upon excesses of stimulation for the attainment of his end finds

¹ Aristotle, *Nicomachean Ethics*, bk. x. ch. 5.

his pleasure waning and his excess ending in painfulness. The torturer depends upon excessive stimulation to give pain to his victim; and the surgeon to relieve pain in some region resorts to excision of the nerve which is producing the abnormal stimulus, or to what he calls counter irritation, *i.e.*, the production of wide painful irritation of low degree in adjacent parts, which implies exhaustion of the activities in the widely distributed nerve-tracts, hence a general reduction of stimulation in the region productive of the severe pain. It seems to me that not dissimilar is the psychological basis of the elimination of pain, and incidentally of such cures as are effected, by means of Hypnotism and by the closely allied methods adopted by the practitioners of "mind-cure," "faith-cure," "Christian Science," &c., &c. The procedure may be looked upon as psychological surgery, if we may so speak. Attention *away from* painful activities, whether produced by Will or Belief or Command, implies strong activity in physical regions other than those which give the pain, and therefore a reduction of the stimuli to, and activities in, these latter regions, which if only moderately diseased may recuperate during these seasons of rest.

I have in pt. i. made a criticism against others which my reader is certain to turn against the theory here defended. 'Can you convert *your* propositions,' he will ask, 'without depending upon the presence of the pleasure and pain themselves for proof of the existence of the conditions which you think determine them?' We of course cannot hope to examine every instance, nor to cover all mental fields in detail: no theory pretends to such completeness. Such a criticism as Mill's against Hamilton can indeed only be maintained where, as in the case in point, a great proportion of cases fails of proof. We may hope, however, to obtain sufficient positive evidence to raise a presumption in favour of our theory without serious unexplained oppositions, and this, in my opinion, has already been accomplished. Still we must not hesitate to meet the above query directly. Can we properly maintain that *All pleasure is the coincident of the use of stored force, and All pain the coincident of conditions where the energy of reaction is less than that of the stimulus in the organs whose action determines the content in each case?* The answer, I think, is to be found in what has preceded this.

The correctness of the statement as to Pleasure is shown by the acknowledged universality of the law that pleasure (content being unchanged) is always reduced by continuance of hypernormal stimulus. This points to something used-up.

What it is that is used-up is indicated by the acknowledged law that abeyance of a content, *i.e.*, rest, must precede pleasure-getting in connexion with the content; rest implying the accumulation of potential energy in the organ involved: corroboration being found also in the fact that decrease in amount of pain-giving stimulus does not bring us back to pleasure-conditions *in connexion with the same content*, unless the condition of rest supervenes.

With Pain the proof is at first sight less clear, but our thesis is implied in the law that pain always arises where the presence of a hypernormally intense content is continuous, after such pleasure as can be obtained has become reduced to indifference: and, although this law is not as fully acquiesced in as the Pleasure-laws above noted, I think the exceptions upon which objection is founded are explicable on the lines laid down in the discussion above. We have further proof in the fact that rest from activity (implying organic repair) is the recognised means of bringing reduction of pain in any special direction; that increase of a stimulus which is bringing pain increases the pain; that increasing ineffectiveness is recognised as an accompaniment of continued painful action in an organ.

Having occupied ourselves so long with physiological conceptions, it will be a relief to the reader, I do not doubt, as it is to myself, to turn for a moment to Psychology proper. Pleasure-Pain, I have argued, are qualities which *may* belong to any state of consciousness. We should be able to bring these phenomena into relation with such qualities as *must* belong to all consciousness, and thus obtain a definition in purely psychological terms.

In a manner Wundt's law does this with reference to Intensity. Let us see whether we cannot state the laws of Pleasure-Pain in terms of Attention.

Pleasure under our theory, as involving the use of stored force, implies a continuance of activity in the organ of the pleasurable content, and therefore a tendency to continuance of Attention upon that content. It implies also an increase of activity in directions connected with the pleasurable content as developments, and this total result may, I think, be called, in the words of Dr. James Ward, "effective attention".

Pain, on the other hand (and here we can scarcely be said to follow Dr. Ward), implies a tendency to cessation of activity in the organ of the painful content, and therefore the disappearance of that content. The continuing stimulus may indeed force the up-coming of the content, but there is no

spontaneity in this up-coming. At the same time the lack of efficient outcome of the stimulus in the direction which gives us the pain will determine a transfer of energy to new channels above (so to speak) the channel which leads to the organ which gives pain, a process which the conservative tendencies of nature will emphasise. This means the production of new foci of attention—the frittering away of attention so far as the painful content is concerned.

It may be well to note here that, on the one hand, the spontaneous activity in pleasure implies a diffusion of activities in the lines of the development of the pleasurable content, while, on the other hand, the activity connected with pain implies new activities in lines apart from such content, *i.e.*, the production of collateral activities in both cases. It is easy to see that nature may turn these different activities to her own conservative uses in directions which shall look to continuance of the activity which is pleasurable (for the use of stored force must be a saving to the system at large), and to a discontinuance of the painful activity (which is draining the efficiency of the system). These tendencies, however, will be *results* gained in the course of development, and not characteristics inherent in the pleasure and pain themselves. Enough examples of these tendencies appear perhaps to warrant the suggestion that "Pleasure" may be "a feeling which we seek to bring into consciousness and retain there," and that "Pain" may be "a feeling which we seek to get out of consciousness and to keep out," but I do not think we are warranted by any means in saying—as Mr. Spencer does, (*Prin. of Psych.*, i. ch. 9)—that the longer phrases are *equivalents* of Pleasure and Pain respectively.

It will be well now to look back at the theories reviewed in pt. i., to note their relation to that here defended.

The theory which connects pain with violation of limit we find correct so far as excessive activity is concerned, and we find the pains connected with the violation in the direction of sub-normal activity or non-activity explicable in terms of excess. The related theories which connect pleasure with replenishment, or which make it dependent upon approach to equilibrium or to normal activity, are based upon facts of pleasurable rest, which we have seen to be secondary and not fundamental. The notion that pleasure is mere absence of pain is denied by our theory: the pleasures so closely connected with contrast being seen to be, not merely negative, but positive states connected with effective activities of other contents than those with which the pain was connected. That pain is always due to restriction of activities we find to be true only if we use the word 'activity' improperly with two distinct significations: (1) as related to the organ involved in the painfulness, and (2) as related to the organism as a whole: the foundation upon which both rest we find to be the condition in the organ

giving the content where energy of reaction is less than energy of stimulus. That pleasure is *always* due to action after restriction we find to be not true, although under such conditions the most vivid pleasure will necessarily arise. The Herbartian view appears as a partial truth, in that opposition of presentations must produce pains of activity in wide mental regions, and in that support of presentations implies confluence of stimuli to the increased activity of the organ, which is the concomitant of the content's appearing pleasurable. The theories which connect pleasure with effectiveness and pain with non-effectiveness of activity we find to be fundamentally true, although requiring radical restatement; the failures involved in their statement as heretofore made being due to the current misunderstanding of the nature of pleasure-pain, and to a reference of the effectiveness or non-effectiveness to the organism as a whole instead of to the special organ or organs involved in the production of the content of consciousness. The law of "self-conservation" we find to be a secondary law which relates to the distribution of pleasures and pains, and which is dependent upon general laws of the evolution of organisms. Evolutionists will at once see how this theory accounts for the connexion, in a broad way, between Pleasure and Pain and activities respectively advantageous and disadvantageous. For those who use stored force (*i.e.*, gain pleasure) in connexion with activities which are *advantageous*, and who find powers curtailed by lack of organic efficiency (*i.e.*, suffer pain) in connexion with activities which are *disadvantageous*, will evidently prove successful where the struggle for existence is dominant in determining the direction of evolution. It is equally clear, however, that this connexion can only be on very general lines, and will be marked by numerous exceptions such as we find.

Pleasure and Pain are so closely related to all mental phases that all Hedonic theory must necessarily have relations of an important nature with all other sciences which are fundamentally psychological. Hedonics cannot be severed from Ethics, from Pedagogics, from Æsthetics. The relations of this theory to these three sciences need to be traced in a manner which cannot be attempted here. In relation to Ethics, it teaches that the *act of will, per se*, is pleasurable as the outcome of the conditions of opposition which are anterior to the will-act. Further, it appears that action in the direction of the greatest desire (*i.e.*, away from the fullest craving-pain) is the most pleasant action, *apart from*

co-existent but not directly related elements of consciousness. But this does not show that the effect of habit may not be such as to lead to action against the strongest desire and away from the greatest pleasure. Further, it appears that the object of desire is not related directly to the production of the painfulness of restriction, which is determined by elements apart from those active in defining the object. Further, that although the *attainment* of a desired object will be pleasurable, the representation of this attainment will not necessarily be so; in other words, that the object of desire, whilst it may be, is not necessarily the attainment of pleasure. Further, that the satisfaction of desire is not the only means of overthrowing desire-pain,—but that persistent encouragement of activity in not closely related regions will lead to a loss of capacity in the organs formerly in active use and a loss of the craving which that capacity carried with it.

In relation to Pedagogics, we have the important corollary that as pleasure implies capacity to act towards an end (if not always to reach it), so desire is an indication of capacity; that aversion or painfulness in accomplishment is not only an indication of ineffectiveness of effort, but a mark of positive loss to the power of the system as a whole. That while exercise in a given mental region, up to and a little beyond the line of painful effort, is of importance for progress and for the growth of effective character, in the main the teacher's effort should be to produce *desire* in the direction of studies in which it is advantageous for the pupil to engage, and to look for pleasure in such studies as the most certain mark that attainment is being effected.

In relation to *Æsthetics* there should be much to say. If, as I think can be shown, *Æsthetics* is a branch of the wider science of Hedonics, we should be able to develop formal *Æsthetics* from the general Hedonic principles here sketched out. The subject is so wide, however, that it cannot be even touched upon now.

III.—THE FESTAL ORIGIN OF HUMAN SPEECH.

By J. DONOVAN.

It would not be a difficult task to induce any student of the speech-branch of anthropological science to take a serious interest in aboriginal music, even if he were offered nothing but the disjointed exclamations of surprise made by travellers among contemporary savages and by ancient writers at the intimate connexion which music has formed with the very roots of mental and moral culture. To observe that at the first glimpse which history obtains of men who had raised themselves above their fellows to the dignity of religious, moral, and scientific teachers, they are found to be called *singers* is sufficient to create an intellectual reverence for things belonging to aboriginal music, if we went no deeper than the bare notice of the fact. An interest has long been growing in matters connected with aboriginal music through the sheer force of the reputation of the art as an accompaniment and supporter of mental culture, and not by reason of any confident insight into its psychological roots. The results of philological and archæological research, and the queries and guesses made about the power of music by philosophers from Aristotle downwards, have been paralleled in such a remarkable way by travellers among contemporary savages that the bare weight of ancient tradition and modern ethnological fact could not help tending to raise music into a high place as a factor in the evolution of mind, though psychology furnished no interpreting guide. But for an indirect evidence of the intimacy of the connexion between early speech and music, nothing could be referred to more striking than the fact that the intimacy of this connexion has encouraged Mr. Herbert Spencer to turn to speech and load the unsolved problem of its origin with the further problem of the origin of music. Now, although a close scrutiny of even the historical aspects of musical pleasure may be calculated to make one feel that making a beginning in music must have required less advanced and complicated psychological machinery than making a beginning in speech, it is undeniable that an easy glance at these historical aspects suggests the contrary. But I believe that neither a close nor an easy scrutiny of the psychological aspect of musical pleasure will lead one to any conviction except that

its origin required simpler psychological machinery than the origin of speech. Indeed I think it will be found that the origin of speech was only possible through the aid of the psychological machinery which belonged to musical pleasure.

If we begin by comparing the ear with the eye in respect of their relative contribution toward making up our mental life and activity, the eye must suffer by the comparison, although it is usual to regard it as the most intellectual of our senses. The superiority of the claims of the ear in generating the peculiarly human characters of mind rests upon its functional passivity. The extreme ease of the animal's control over the eye and the absence of any control over the ear made a difference in the degree in which the common animal appetites dominated the manner of the reception of the two kinds of sense-impression. The passivity of the ear allowed auditory impressions to force themselves into consciousness in season and out of season, when they were interesting to the dominant desires of the animal, and when they were not. These impressions got further into consciousness, so to speak, before desire could examine their right of entrance than was possible for impressions which could be annihilated by a wink or a turn of the head. And the more attention any impressions could command without there being anything beyond them of interest to the animal's life-caring instincts, the more likely were those impressions to lead to the origination of one of the chief human powers of mind, that of grasping more than one impression and becoming aware of a relation of difference between them. The subjection of the eye to life-caring interests must place it below the ear in any speculation about how a beginning was induced in the apprehension of relations of difference between sensations, however superior the eye became when the beginning had been fairly made. But, granted that the ear was a possible channel for educating the consciousness of some animals up to this power, where could the stimulating influence come from? The natural stimulants of the organ could not have changed radically, at any time, from what they were in all ages of animal life: why, therefore, should they begin at any particular time to educate the consciousness of the ancestors of man? or why do they not educate that of other animals which possess highly developed organs of hearing? ~~This is~~ ^{These are} the sort of questions which are in fairness put in the way of an attempt to show how any of the specially human characters of mind could originate without assuming that other characters existed

already. And, whether comparative psychologists are justified or not in supposing that their constructive schemes of the origin of the human mind meet and answer such questions, I think that there lies still untouched a mass of important historical and ethnological facts which are better able to answer them than any which have been yet brought forward. But it is necessary to bring these facts into the light of certain psychological suggestions which are offered by a new analysis of the art of music. The solution which is possible along the lines of this analysis avoids all the old difficulties which stood in the way of a beginning in mental training when the animal's impulse to educate itself was thought of only in the blind seeking for the satisfaction of natural appetites. If the impulse was an old, naturally-working one, which is common to many animals, it could not face the questions, why it did not begin its work sooner, or why it does not effect it in other animals. The impulse behind the effort in mental training to which attention is invited here was free from every kind of self-caring stress. It was intensely pleasurable, yet not an old animalistic pleasure. It was the incipient pleasure of music.

7 The facts of history and ethnology which may be given a new aspect when regarded in the light of the analysis of music cover a very wide field of the early manifestations of human thought and emotion, beginning with the first and rudest vestiges of communal sympathy and tribal glorification, and extending up to the national song or epic. In order to work down to the root of these facts quickly, it must be observed that, while communal interest itself is not peculiar to man, it is peculiar to man to give expression to this interest in a way which has nothing to do with life-caring instincts. Now what is the rudest and most primitive manner in which man is found giving expression to a communal interest apart from practical co-operation for the care of life, hunting and fighting, &c.? The most ancient traditions of the races now civilised and the ethnology of still uncivilised races give the same answer. The communal spirit of man finds its first and rudest expression in the bodily play-excitement which is found in all grades of development from that of the lowest Australian or American aborigines up to the choral dance out of which the first glorifying songs of the race and its heroes are found growing. Certainly we cannot catch sight of this play-excitement in its first spontaneous outlet; at the lowest grade in which the manners of its outlet are found, they had already become manners of racial tradition, and had become involved in the peculiar racial habit of

festal celebration. But (1) bodily play-movements in imitation of actions, (2) rhythmic beating, (3) some approach to song, and (4) some degree of communal interest, display themselves as the most constant elements of all festal celebrations. The degree in which the play-excitement is infused with a spirit of communal interest seems to vary considerably in different tribes, but if we start from the generally-accepted explanation of play-movements in animals, and grasp the ultimate reason why play-excitement became infused with the communal spirit, there will be no difficulty in tracing evidences of this spirit even where they are most hidden by accompanying habits. When the strain of action resulted in the satisfaction of the chief animal desires and the play-movements of the pleasant nervous reaction drifted into the manner of the actions that brought about the satisfaction, it was impossible that some of the communal interest which lived amid the actions should not be resuscitated in the play. Few will deny that this is how play-excitement drew communal interest up from its lower animal grounds of life-caring instincts to the distinguishing human habit of expressing this interest apart from actual life-caring co-operation, even if they deny that the event was important in its consequences. And, if it is kept in view while the most familiar phenomena of aboriginal festal celebrations are recalled, it will be perceived that fact verifies this simple interpretation of the connexion between play-excitement and communal interest. In the chief ethnological works, festal celebrations are often placed under the heading of "amusements" even when they display not only a communal interest, but also a pronounced religious spirit. In thus classifying these habits the ethnologists are obviously influenced by the large element of seemingly aimless play which enters into them, by the rhythmic beating, hilarious cries and songs, &c. They would not attempt to deny that, whether the dance was to celebrate a victory in war, the capture of an animal in the chase, the stranding of a whale, the coming of the salmon, or the finishing of harvest or vintage, the play-excitement would be fused with a more or less solemn spirit of communal interest. Although bodily play-excitement and communal interest are constant elements of festal celebrations, neither of them may be the moving spirit of the celebrations that travellers observe in any particular instance. Having become traditional habits of the tribe, the celebrations had clinging to them interests which were superior to their originating impulse, interests of patriotic and religious memories, which could only have

26p.
504

developed along with the mental development which resulted in the origin of the human characters of mind. When the ethnologist regards the celebrations, such interests as these are their vivifying spirit. But if we are to interpret the previous course of their development at all, we must follow the psychological consequences of the fusion of the two primitive elements, and see in how far they agree with the state of things familiar to the ethnologist and philologist.

The foundation we have to work on is the animal consciousness as occupied with the diffused pleasure of bodily play-excitement, and the communal elation following success in a common enterprise. This state of consciousness must be preserved in order to do its work. Its natural modes of expression tend to preserve it, *i.e.*, the bodily play-movements in imitation of the successful actions and the rhythmic beating. These movements give to consciousness preservative elements of sensation. But they have to compete with destructive elements connected with life-caring instincts. These latter, for instance, sights or sounds of a terrific character, must often have completely destroyed the play-excitement. But our speculation has no concern at all with the violently destructive elements of perception. They take away our fundamental fact till the conditions occur again for bringing it into existence. It is upon slightly destructive elements of perception that we should direct our attention. It is in face of slightly destructive elements (ordinarily occurring sensations connected with natural passions, life-caring instincts, &c.) that we must ask if there was anything about the production of the preservative elements of sensation which rendered it likely that they would improve in their competing effectiveness. The question being brought to this point, it is hard to say that it would not occur to many psychologists to look to the rhythmic beating for the direction from which the improvement might come, even if they saw nothing in the art of music to guide their speculation. But we are distinctly guided in this direction by the psychological grounds of the development of the art of music. For it is possible to work down from the greatest symphony of Beethoven to the rudest rhythmic beating of savages, and show that every step of tonal development between them was made in order to improve the effectiveness of the elements of sensation which could preserve the content of consciousness springing out of play-excitement and communal elation. Passing over all plausibilities from geology about the period when objects capable of emitting a musical tone began to be struck for

the rhythmic beating of the play-excitement, I have but to point out that, when a musical tone was produced in the persistent succession of rhythmic beating, the elements of sensation which had but an ordinary destructive power would have less opportunity for completing the psychic movements on which their destructive power depended than when the sounds produced in the beating were only noises. By its own natural right the impression of a musical tone has a startling vividness. The attention-drawing power it possessed by natural right was enhanced by the conditions of its production, which ensured repetition in a persistent temporal succession. The persistent succession of such impressions inevitably induced an attitude of sustained expectation in the animal consciousness. And it was the absorption of attention implied in this expectant attitude which shielded the feeling of play-excitement and communal elation from all destructive elements of perception, except those which were linked instinctively with peril or the strongest animal passions. It is needless to say anything about the way in which musical tones must have developed in their attention-absorbing power. The compound nature of the musical tone, and the resulting intimacy of its relation with other tones at the intervals of octave, fifth, &c., speak for themselves. To insist that tonal constructions have always been increasing their absorbing power would be to insist that the art of music has developed. I hasten to call attention to something that was happening both before and after the stimulating rhythmic beating produced tones, I mean the animals' excited cries. In face of the exceedingly stunted supply of vocal tones furnished by the animals which are the nearest physiological allies of man, it may be asked if comparative psychologists who construct a bridge between the lower animals and man do not see a difficulty in the general aspect of "phonetic decay" in the history of speech. How became the original supply of vocal tone so copious as to bear the decay of ages in the sign-bearing growth of consonantal checks? One who assumed or admitted that naturally occurring emotional excitement effected a beginning in the production of such vocal tone would be, apart from the insurmountable speculative difficulty of the event, ignoring the fact that the animal's cry of natural excitement offers about the most melancholy outlook for future development or variety that is offered by any natural phenomenon. The natural passion is always the prison-house of the cry it impels forth, shutting it off from the possibility of furnishing a germ of future

development of any kind. But the fact of the copious supply of vocal tone in the beginning would render it necessary to assume that cries of excitement did not merely break through the walls of their prison-house, but became infused with a mighty spirit of development from somewhere. Taking up the chain of psychological events arising from the conditions of nascent musical pleasure at the point where we reached the animal's cries, let the reader observe that the same excitement which impelled to these cries also impelled to rhythmic beating, and thus produced a persistent auditory model for the cries. The inducement to break the cries from their purely natural character to follow the model of the sounds produced by beating could not help working its way in time without any conscious effort on the part of the animals. But here we reach a point on which the facts bearing upon our problem will hardly ever justify a fixed opinion, namely, whether or not the rhythmic sounds were of musical quality before they induced such vocal imitation as could become effective towards establishing the elements of speech. It will easily be perceived, however, that the point is not of fundamental importance. There was certainly more musical possibility in the vocal apparatus of any likely progenitor of man than in the first rude objects of percussion. If this apparatus were drawn to adapt itself at all to a rhythmic succession of sounds it would produce better musical sounds than its model. All that is necessary here is to indicate how the walls which penned vocal utterance within mere animal habits or passions were broken through. Of course we know as a fact that tones of musical quality and in musical relations were produced in time from objects of percussion, and that the vocal apparatus succeeded in adapting itself to the production of these; and it is obvious that the activity implied (destined to become the activity of song) would more and more effectually narrow the opening into consciousness for elements of sensation which would be destructive of the pleasurable feeling which is the foundation of our study.

I will now venture to bring our result—namely, the excited cries' being drawn into the mould held forth by tones produced from rhythmic beating, at a time when the animal-consciousness was steeped in the emotions belonging to the actions out of which the play-excitement sprang—into relation with the belief fostered by philological research, that the ultimate roots of language, the "vocal signs," are the signs of concepts of actions, and into relation with the mysterious union existing between music and speech at the earliest

glimpse which ethnology or history obtains of them. What was there favourable for the origin of concepts in the circumstances of this vocal production of tones? If we regard only the superficial aspect of the musical inducement to a persistent repetition of the vocal tones, it is evident that the conditions are laid for the tones' becoming mnemonics of the actions they were associated with in all the members of the community that let the elation of success fuse with, and find an outlet in, bodily play-excitement. If we follow the deeper psychological results of the production of tones, we shall see at work a portion of psychic machinery which avoids all the worst of the difficulties that have hitherto blocked the way to an understanding of the purely natural evolution of concepts with their fixed vocal signs. How a vocal sounding mark should ever become fixed in the consciousness of animals (not yet possessing the specially human characters of mind) to the vague, manifold, presentative elements of a concept, is a problem which may be solved in the light of the psychological conditions of this vocal production of tones. If we sum up the results of the nervous outlets of the excitement (bodily movements, cries, rhythmic beatings), it will be clear that—(1) the movements in imitation of actions, besides tending to keep up the general and diffused sense of the elation of success of the actions, tended also to specify particular actions in consciousness. The sensational and perceptual details of the actions as they were imitated would inevitably bring their peculiar emotional background into consciousness, and so far particularise the play-excitement. The war-dances and phallic-dances of savages demonstrate the truth of this, for they often so fully particularise the actions imitated in play, that the play-excitement dies away in a natural passion. (2) The excited cries having become rhythmic and tonal along with the rhythmic tones produced from external sounding bodies, besides fixing themselves upon the presentative elements in consciousness, tend also to preserve the stability and integrity of the pleasure clinging to them against any destructive sensations or perceptions. My space is too near its limit to permit me to do more than invite the reader to think a little of the subtlety of this economy: how the sounds which held the animals' attention with their sustained temporal succession and their pitch-relations had by psychological necessity to become, every moment that they did their shielding work, more and more successful reproductive agents for bringing the vague, pleasurable, presentative elements of past actions back to consciousness again, when the animals' life-cares or

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brutal instincts had driven them away; how the sounds became able to keep these elements together in the fire of an intensely pleasurable feeling until they had time to fuse into the wonderful phenomenon of a concept.

My conclusion, plainly, can be nothing else but that the psychologist will advance upon the philologist's negative definition of the ultimate roots of human speech. The philologist says that roots are elements of words which analysis can reduce no further. The psychologist may say that the root is not ultimate for him. He can trace it back to the musical tones which became reproductive agents of the vague presentative elements of actions as they had been repeatedly held together in consciousness by the psychological machinery of nascent musical pleasure. He can trace the root back to the rhythmic sounds that savages produce when they beat sonorous bodies amid the play-excitement which was originated through communal elation of the success of communal action, and which had become, at the earliest glimpse we obtain of it, involved, like the oldest and most sacred of the words it gave birth to, in the race's traditional custom of festal celebration.

IV.—INDUCTION AND DEDUCTION.

By L. T. HOBHOUSE.

IN a previous article (MIND, No. 62) I said that I aimed at proving that all reasoning involved generalisation from observed facts, and that such generalisation could be shown to proceed on a definite principle. In the course of the article I tried to make clear what this principle was. The inferences which I took and analysed were mainly cases of what would usually be called inductive generalisation, and it might be urged against me that deductive inference is a wholly different thing. This is the point which I now wish to discuss. Does Deduction involve something quite different from generalisation, or is it the same thing under a different aspect, or a particular species of the same thing? In any case, can it be found to imply any single axiom, and if so, what is the relation of that axiom to the axiom of Induction?

There are two main ways in which Induction and Deduction may be distinguished, and I will deal with them separately. First of all, we may distinguish the assertion of a universal from its application. This distinction is too familiar to need illustration, but we are concerned with the principles involved in it. The point is, Does the assertion of the universal rest on one principle and the application of it on another? I answer—Clearly, no. The general 'All A is B' is meaningless unless it is to be applied to fresh particulars. If not the whole, at any rate an essential part of its logical value is precisely this, that it constitutes a rule for dealing with fresh particulars. Correctly viewed, it is itself the principle on which we go from minor to conclusion. That we assert or apply such general principles at all implies, as we have seen, the axiom of Induction, but no new principle is involved in applying a rule which you have only asserted in order to apply it. The *Dictum de omni et nullo*, nominally the axiom of the Syllogism, is really a definition of what we mean by a principle. It is then no tautology, but may be paraphrased thus: 'When we assert B of A as such, we mean that we shall assert B of any A_1 or A_2 '.

To understand this clearly, we have to raise rather a wider question. The application of a universal to a particular case is represented by the Syllogism in which the major is a general judgment and the minor a particular judgment of

perception (I say nothing here of cases where the minor is also general)—the familiar Syllogism which supplies us with information concerning the latter end of Socrates or Mr. Gladstone. Now it may be said: 'The conclusion in this Syllogism is a different judgment from any that we have had in the premisses, and the evolution of one judgment out of another or others is inference. Therefore the Syllogism is inference. Therefore it must proceed on a definite principle of its own.' This leads us to the broad question of the principles of Inference.

Whether the term Inference should or should not be applied to every case of the evolution of one proposition from another is very largely a question of terminology. With that I do not deal, but I wish to distinguish three cases of this evolution with a view to understanding what the axioms of inference are and in what cases they are applied. Broadly then, when I compare two judgments with each other I find that they may be—

1. Tautologous—the same assertion of the same fact.
2. Different statements of the same fact.
3. Assertions of different facts.

Each of these distinctions needs a word of explanation. To begin with, tautology and different assertion of the same fact, or restatement, are not quite the same thing. If I say, 'This A is B, therefore the fact which I denominate A is the fact which I refer to as B,' this is pure tautology and absolutely pointless. The variation in words in no way affects the meaning. If, on the other hand, I gather up two or three propositions into one, 'as A is X, B is X, C is X \therefore A, B and C are X,' this is not tautology, for it may not be valueless: but yet it does not state any fact not already stated; nor does it involve any conceivable axiom unless it be the axiom of Contradiction, which is in effect a statement that you mean what you say. Thus I take judgments to be tautologous when they might equally well be put into the same words, and I say that one restates the other when they assert the same fact but could not equally well be put into the same words.

From both of these we may distinguish judgments which assert different facts. A judgment expresses a relation between two terms, and hence two judgments may be said to assert the same fact when they assert the same relation between the same terms. But if either of the terms or the relation differs, then they assert different facts. Thus 'A is B' is one fact, and 'A is C' is another, as long as the attributes B and C are in any way distinguishable as different terms. Further (and we shall see the importance of this later on),

'A and C are both related to B' is one fact, 'A is related to C' is another, and not merely a part of the first, for we take A and C in one relation in the first proposition, and in another in the second. On the other hand, $A-B$, $B-A$ (the symbol marking any relation of two terms) are precisely the same fact, the order of assertion alone being different.

Now mark the difference in evolving one proposition from another, according as the two do or do not assert the same fact. In the former case, to deny the one is to deny the other; or, what is the same thing, to assert one and deny the other is to deny those general laws of thought which lay down the conditions on which alone judgments have meaning. The judgments are simply convertible: we have $A-B$, $B-A$. In the latter case, the two judgments express different facts; hence, however they are connected, to deny one is not to destroy the meaning of the other. It may indeed virtually deny the other, but only on the understanding that some axiom expressing the connexion of facts holds true; and in this way two judgments are not accurately spoken of as the same, because, being connected on some principle and the principle being taken for granted, they are seen to stand and fall together.

I would thus distinguish the cases in which one proposition is drawn from another by a double criterion. On the one side, I have restatement of the same fact, implying only that the first statement has meaning, and implying therefore no general truths but such as are already implied in making an assertion at all. On the other side, I have assertion of a second fact on the basis of a first, implying, beyond the fact asserted in the premiss, some general truth of the connexion of facts. When I say $A-B \therefore B-A$, I restate the same fact, and imply no general principle but the law of Contradiction. When I say $A-B \therefore A-C$, I state one fact on the basis of another, and imply some general principle on which I have connected B and C.

Taking the law of Contradiction, then—and possibly other general principles—as implied whenever we make an assertion, and therefore whenever we base one assertion on another, the question that naturally arises with regard to any inference is, What *further* principle, if any, do we invoke? The so-called immediate inferences, like $A-B \therefore B-A$, we have seen, invoke no further principles, whereas the reasoning that asserts a new fact appeals to some principle of the connexion of fact. As such assertion appears to me the special work of reasoning, I should be inclined to call such principles the principles of Reasoning proper.

Applying this doctrine to the case of Syllogism: the conclusion will be tautologous if it asserts something already asserted in one premiss; it will be a restatement if it asserts a fact already asserted by the two premisses taken together in such a way that the premisses will be meaningless unless the conclusion is true; otherwise, it is a statement of a new fact involving a principle of the connexion of facts. Which of these is it?

Our first answer depends on the meaning given to the major. If 'All A is B' is a mere summing up of the perceptions of all the individual A's, then $A_2 - B_2$ has already been perceived. The conclusion then states what is implied as already known by the assertion of the major, and the whole process is needless tautology. But the major does not merely sum up a number of perceptions. It is not a judgment of perception, but a generalisation based upon perception. It is not a statement of what is or has been perceived, but of what will always be. Hence it does not contain the conclusion as a fact of perception on which it rests, but as a rule for drawing it from the minor.

Thus the conclusion is not tautologous. On the other hand, taking the premisses in combination, we get 'Any $A - B$,' and 'This A_2 .' The conclusion, then, states what is already asserted. There could be no meaning in saying 'Any or All $A - B$ ' unless we meant to assert B of A_2 . The denial of the conclusion would leave one premiss meaningless. Though the major does not take this A_2 to have been examined, yet it is an assertion by anticipation about this A_2 when identified as A. We have, then, in the premisses the present case ('This') qualified as A, and B asserted of all A's. In this statement both terms of the conclusion are contained. The conclusion, then, does not assert a different fact or postulate any law of the connexion of facts. It is the statement in a single judgment of what the two premisses mean when taken together. It reasserts the same fact which they assert.

Taking both major and minor as given, the conclusion asserts no new fact. But to put these two premisses together, and so draw the conclusion, requires a real, sometimes an important, movement of thought. This movement is often described as the making explicit what is implicit in the premisses. This is correct if we understand 'implicit' in a very precise sense. For, in a way, the conclusion may be said to be implicit in the major alone—*viz.*, on condition that the minor is true. And, in a way, an inductive generalisation is implicit in the experiment that proves it—*viz.*, on condition that the principle of Induction is true. But the con-

clusion of a Syllogism is implicit in the premisses on no further condition at all than that these premisses have meaning. Briefly, Generalisation involves an universal principle connecting different facts : Syllogism does not.

Taking the two premisses for granted, the conclusion involves no general axiom. If, however, we turn our attention to the premisses themselves, we find, of course, that the major rests ultimately on generalisation from particulars. Syllogism then appears as simply the opposite side of generalisation. In the latter we assert a universal for the first time, in the former we apply a universal already asserted. But in both we are dealing with the same relation of universal and particular. In both the particular is regarded as exemplifying an universal. Hence, whether we assert or apply our universal, the same ultimate logical fact, expressed in the axiom of Induction, is at the bottom of the process.

The whole matter is best understood by going back from the major to its evidence, and so taking into one view the whole process from data to conclusion ; we have then as evidence the observed relation $A_1 - B_1$; from this datum we may, on the axiom of Induction, conclude either the universal $A - B$, or the particular $A_2 - B_2$. We may draw this particular conclusion without expressing the universal, but, logically, the universal must be true if the particular conclusion is warranted. The one axiom postulated, then, in concluding from our evidence is the axiom of Induction, and, logically, both the particular and the universal conclusion are drawn from that evidence upon that axiom. But psychologically, or in the order of individual knowledge, we may proceed differently. The conclusion $A_2 - B_2$ is particular, and perishes. The conclusion $A - B$, resting on precisely the same ground, is universal, and serves as a rule for further use. Only, when it is applied in the future, no further principle is required than that upon which it was originally asserted. It is upon that axiom that we assert the universal in the first place, and it is upon that axiom that we expect the new particular to behave like the old. The universal has become a rule, and though its application means new movements of thought, it does not make logically new assertions such as imply any fresh principles of the connexion of facts.

Regarded as an advancing movement of thought, then, the process from particular to particular forms one whole, in which a universal truth is asserted and applied on the ground of a particular observation by the implication of a

single axiom. When we ask where the discovery or fresh assertion lies in this process, we may say in the assertion of the universal. But if we ask what is the logic of the whole matter, we do not find this in the assertion any more than in the application of the universal. The logic of the matter is that the particular is a case of the universal; that is to say, that the axiom of Induction applies to these particulars as to others. It makes no difference to this purely logical view whether it is the particular which we first observed that we consider as exemplifying a rule, or whether it is any new particular that turns up. In either case we are bringing a particular under a universal relation, and to state the particular as a case of the universal is to give the logic of the process.

Syllogism, then, as a process of combining two propositions into one, involves no axiom at all; as employing an universal premiss, it presupposes the axiom of Induction and no other.

It is implied in this view that the evidence of the syllogistic conclusion is always the observed particular facts. The major premiss is not evidence at all, but it is as necessary a part of the process as the evidence itself. For if it is not true the conclusion is not warranted. It is itself an inference which we draw from the evidence, and the principle on which we can draw conclusions of a different kind, *viz.*, particular conclusions, from the same evidence.

So far, however, we have confined ourselves to a single type of Syllogism—that which applies a single universal to a new particular case, and accordingly we have distinguished the inductive and deductive parts of the inferences considered as consisting respectively in the assertion and application of the same universal. But a different distinction may be drawn between Induction and Deduction. The whole process of bringing particular facts under universals by observation of similar particulars may be called Induction, while the combination of several universals in a chain of reasoning is called Deduction. Thus, if I say that free trade is good for a nation on the ground that it has been good for England,—that is an induction. If I say it is good for a nation because it allows a great increase of cheap imports, and increased imports again must be paid for, and therefore exports must be increased, and therefore manufactures are stimulated,—that is a deduction. Symbolising, we get in the two cases—

$$(1) A_1 - B_1 \therefore A - B \text{ or } A_2 - B_2.$$

$$(2) A - B - C - D \therefore A - D.$$

Now it may be asked what is the connexion between

these two types of reasoning. In the first, which I will call Generalisation, we assert an universal on the ground of a particular, or a particular on the ground of a similar particular. In the second, which may be called Construction, we assert a relation between two universals on the ground of the relation of each to one or more intermediate universals. In the first case, we generalise a single relation; in the second, out of several relations, all general, we construct a resultant relation, or, if you like, construct a whole in which the resultant relation appears as part. At first sight there seems no point of contact between these two processes.

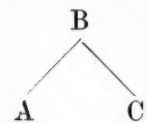
I am the more concerned to find out some connexion between them because I am convinced that both processes are genuine processes of Reasoning. There has, I think, been a tendency among different writers to slur over the one or the other. But you cannot, out of the mere assertion of several universals, get the connexion of them all into a whole. Still less can you connect universals unless you have first got your universals to connect. It is one thing to say $A - B - C - D \therefore A - D$, but it is another thing to know that the several links $A - B$, $B - C$, and so on, are all universal relations. In the instance quoted, I must know that free trade will really lead to increased imports, that increased imports must be paid for, and so on. It may be said that these propositions are obvious, but I should like to know how they would be obvious if they did not represent the results of daily observation; unless indeed they are regarded as deductions from more general truths of commercial human nature, which only leads me to repeat my question—How are these ultimate generalisations known?

Construction then involves generalisation at every step. $A - D$ is a resultant relation obtained by putting $A - B$, $B - C$, $C - D$ together, but $A - B$ and $B - C$ must each of them be generalised from observation. The question then is not whether construction is the only form of reasoning, the *unum necessarium*, but what kind of principle the assertion of the resultant relation (or the constructed whole) involves when we take the component relations as given.

I expressed above my belief that all reasoning involves generalisation from observed cases. Now I admit that construction, as I have defined it, is a true reasoning process. In what way then does it involve generalisation?

This question has generally been answered by the invention of a major premiss, cut out, so to say, to suit the occasion. In many instances this may be a sufficient answer. That a given combination gives a certain resultant

may be a fact generalised from experiment like any other. But that this simple answer in this form is adequate, Mr. Bradley has sufficiently disproved. Taking the inference which he uses (*Logic*, p. 226), 'A to right of B, B to right of C, \therefore A to right of C,' and comparing it with the major premiss which he suggests for it on the following page, any candid person would make the confession which is demanded of him, and would allow that though he has made the inference often enough he has never seen this premiss before. Of these simple constructions we certainly do not make any explicit or conscious generalisations. But that leaves us with the question, How then do we know them? Given the $A - B - C$, how do I know $A - C$? How do I know the resultant relation formed by two relations? In the first place, $A - C$ is not precisely the same fact as $A - B, B - C$. It is not an independent fact, nor wholly separate from them, but it is not the same fact reasserted. If I take A, B, C to represent three points in space so arranged that I cannot see all of them together, I may know $A - B$ and $B - C$, and may put them together as $A - B - C$, but yet not form a conception of the resultant relation $A - C$. I may travel mentally from A to B and from B to C without drawing the base line $A - C$. Conversely, I may know $A - C$ without knowing $A - B$ and $B - C$. In fact, as above remarked, the judgment $A - C$ deals with terms already contained in the judgment 'A and C are related to B,' but asserts a relation not asserted in that judgment. The relation of A and C to B is not their relation to each other. Doubtless, one judgment *virtually* asserts the other, but only, I think, on the understanding that some general axiom of the resultants of relations holds good. Secondly, I do not see how I could put $A - B, B - C$ together and know what the resultant $A - C$ would be *if I had never seen such a construction before*. Putting the terms in the adjoining form,



I see $A - C$ to be the relation that results when we have $A - B, B - C$ as they are there given. If now I am told that there are three other points in the next room, or in the moon, if you please, and of these $A_1 - B_1$ is a relation like $A - B$, and $B_1 - C_1$ like $B - C$, I can at once construct the resulting $A_1 - C_1$. But how? By generalisation from the instance once observed.

I see no evidence that a construction could be carried out accurately by the mind unless a similar construction had been observed. Of course a construction may be compounded of elements, each of which is itself constructed of

simpler ones, and we may have never observed the whole compound before. In this case we must be acquainted with the method of constructing each element singly, and then with that of combining all the resultants together. But we cannot, I believe, construct where we have no instance from which to generalise. To take a different case: I do not believe that I should know that two and two are four if I had never added them up, just as I do not know what $756432 + 91864$ make because I have never added them up, and the addition is, I believe, at bottom a construction of constructions presented originally to sense.

But I will go back to our geographical example. I do not believe that I should know that A to right of B and B to right of C gave A to right of C, had I not some instance of points so related in my mind. I do not know the relation of A to C if I am given a very complicated system of links by which to connect them, unless I can assimilate the system to one which I do know already. And in the same way, even with a system of relations I know well, if I wish to get a clear idea of them in my head, I draw a plan and generalise from the plan to the relations which I do not see.

It will be answered: 'You may not know that $A - B - C$ gives $A - C$, but once shown to you, you see it must be so'. If the word 'must' means what I take it to mean, this is precisely my point. As soon as we see the resultant we take it as a general truth, or we see that nothing external to the system of relations considered can make any difference to the resultant. The work of generalisation, performed in instances ordinarily called inductive by laborious elimination of concomitants that may possibly have influenced our fact, is here put aside by the nature of the assertion made. Accordingly we do not consciously generalise such observations at all. If ever we do, our generalisation sounds superfluous and unmeaning, because all along we have no doubt of the single instance being typical.

The nature of the generalisation made in these cases may be shown most clearly by putting down an axiom on which a great mass of them may be taken to proceed. I do not suggest that it is the universal axiom of Deduction, but it is typical of a class of Deductive Axioms. I will write it thus:—

If, where two terms are in any way related to a third, a relation between the two is observed, then when any other two terms are similarly related to any third, the relation between these two will be similar to that observed between the first two.

This axiom, it will be observed, like the axiom of Induc-

tion, is a principle of generalisation. It states that what holds in one case will hold in another. If, then, our constructions are really formed by generalisation from observed constructions, it will be true that deductive reasoning is generalised observation as well as inductive. The difference will be in the nature of the generalisation and of the observation. In Induction we observe a simple relation, as $A-B$, and we have then, by repeated observations or observation of concomitant facts, to show that no external C has influenced this relation. We then assert this simple relation universally. Thus the work is only begun when we first observe what we afterwards generalise, and this first observation is not the difficulty. Just the opposite holds of the generalisations of Deduction. Here the difficulty is with the observation. We have first to put a complex system of facts together, and then observe their resultant. That being done, we generalise at once on the principle just laid down.

To understand thoroughly the nature of this axiom of Construction, we must bear in mind the conditions under which alone we can speak intelligibly of one relation as a resultant of two others. If my terms A , B , and C denote concrete subjects, each capable of being viewed in many relations, or rather in relations of many types, and if the relation $A-B$ is of one type, and $B-C$ of another, I do not necessarily get any 'resultant' relation $A-C$ at all. It must be understood, then, that A , B , and C are what I will call *simple or single points of relationship*. Of such a conception the spatial point gives a very clear example. The spatial point A is a centre of an indefinite number of relations, but they are all relations of one kind—space-relations. If A be a physical particle, it may be a single thing, yet it is related to other things not only spatially, but in many other ways. Each of the different kinds of relation into which the thing may enter implies a different aspect or attribute of the thing. And each of these aspects or attributes is the basis of many relations. Thus in the concrete thing we get a double complexity. It possesses many attributes, in virtue of each of which it stands in a wholly different kind of relation to other things. And each attribute involves it in many relations of the same kind. There may or may not be forms of construction involving relations of different types, but we need not concern ourselves with them here. The simplest construction on which others rest is that of two relations of the same type, and the axiom which I have suggested applies to relations so understood.

This obviates the criticism perhaps justly passed on Mr.

Spencer's axiom of the Syllogism—"Things that are related to the same thing are related to one another". This statement may be too wide unless thing and relation are defined in some way. But I would point out a more fundamental difference. Mr. Spencer's axiom does not tell us enough. It says, in effect, if A and B are both related to C they will be related to each other. But it does not say *how* they will be related to each other. It does not give us any idea whatever of the kind of relation between them—not even whether it is a relation homogeneous with $A - B$ and $B - C$. It merely says there will be a relation between them. Now in the axiom suggested above we know the relation precisely, because we assimilate it to an observed case.

I have thus suggested two axioms as implied in generalisation. These I believe to be types of the axioms which are postulated by Reasoning. I do not mean that generalisation is the only aspect under which the work of Reason can be viewed. In the present article I have given full weight at any rate to the constructive or synthetic character. But I do say this, that the peculiarity in reasoning, by which it is distinguished from judgment and all other intellectual operations, is that in it we proceed from a fact that is or has been present to the mind to another fact that may never have been present to the mind at all. This process is that of generalisation, and if reasoning is something that proceeds on any definite principle at all, there must be some axioms which lay down the conditions under which facts not presented may be known to exist. This is what the axioms of Reasoning have to do, and they are thus distinguished from those principles which have been called the 'Laws of Thought'. These last express conditions which any assertion must fulfil in order to be an assertion of fact at all, but do not give us any ground for asserting any one fact in preference to any other. The axioms of Reasoning are not implied by assertion as such, but when a first assertion is made do give ground for asserting some other fact in consequence. They are essentially general principles upon which, given one fact, you can state another.

It remains to ask whether there is any relation between these two axioms. It will be noticed that both are principles of generalisation, but that, while one holds only of relations between terms of which other relations are already given, the other holds of any related terms whatever. This would suggest that the Constructive Axiom is really a case of the Inductive, and on the whole I believe it to be so. It is, I think, a case of the Inductive Axiom in which any possi-

bility of the interference of an agent outside the terms considered is put aside by the nature of the terms themselves.

According to the axiom of Induction, the relation $A - C$ will be constant unless there is a change in the facts conditioning A or C . The converse of this is that, given all the conditions of A and C unaltered, the relation $A - C$ will be unaltered : in other words, the relation $A - C$ is conditioned only by those facts which condition A and C themselves. But in the case where we can apply the axiom of Construction the conditions of A and C are given as unaltered. A and C are (in our example) the mere abstraction of points at a certain distance from B . Between points so determined we observe a relation, $A - C$. Now we say, given other points similarly conditioned, the relation between them will be similar. This is simply to apply our old axiom of Induction in a case where the conditions are given. Our new axiom then is the old one *plus* a postulate. The old axiom states that the relation will hold unless the conditions vary; the new one postulates that the conditions do not vary. Hence to use the first axiom we have to find out by observation what the conditions are. We apply the second to a case where the conditions are laid down by definition, and where it is taken as given that they remain unaltered. Nor is the axiom of Construction the only one that can be formed in this way. Whatever the conditions of a relation may be, so long as we postulate that they are unaltered we can assert that the relation will hold. This will give us axioms differing in statement and in application as the conditions postulated differ, but all constructed on the same principle, all applications of the general axiom of Induction to cases where the conditions are wholly or partially given as similar to those found in the case observed.

The generalisations which we form by the help of these axioms are not as a rule explicitly stated as generalisations. We do not write them down as majors. None the less they are logically the true principles of our constructions. We do not state them in the abstract and then consciously apply them to form a particular construction, yet the construction would not be warranted if the principle were untrue. Each construction, in other words, is made on its own proper principle, though it may not be explicitly referred to that principle.

From this point of view the logical justification of any construction is that it is the conclusion of a syllogism, it is formed by the application of a general principle to a particular case. That this is so is obvious where the law of a con-

struction is obtained by, say, physical experiment. That $A + B = C$ may be a generalisation from a series of observations, just like any other law; and the inference to this case of $A + B$ is an obvious instance of the application of a law to a particular case. It is equally so when the law of construction is formed on one of the axioms which we have been considering from the observation of a single instance. In this case the work of generalisation is too easy and obvious to need expression, and the law if you write it down is a platitude; it does not enter into the conscious process. Nevertheless it is the logical justification of that process which thus ultimately rests on the Inductive Axiom in some shape or other. The process that occupies attention is that of putting elements together into a whole, yet this is in fact carried on upon principles that are tacitly assumed, but which must be logically justified as generalisations from evidence if the process that implies them is to be held valid. A construction then is always a conclusion from a major, resting either on the ordinary methods of induction or on a special application of the Inductive Axiom. Hence, generically, Deduction is the application of the general to the particular, and of this the process of Construction is a special case.

Hence we have seen that the principles of Induction are essentially those of all inference whatever. The basis of reasoning is always one or more observed particular facts. The result of reasoning is always the assertion of some fact, not stated in the premisses, as being true if the premisses are true. This result is due to generalisation, which is always involved in reasoning, and which ultimately rests on a single principle, which we have called the Axiom of Induction. The generalisation may be merely implied as the principle upon which we infer from one particular to another, or it may be explicitly stated in abstract terms. In either case it is logically essential. In the latter case we may distinguish the act of asserting it from that of applying it, and call the first Induction and the second Deduction. They may, in fact, form separate actions of the mind. But they involve one and the same principle. We may, further, distinguish inferences according to the general nature of the premisses and conclusion, in accordance with which the stress of difficulty changes. Where we wish to establish a relation as universal without any conditions, the main difficulty is in the assertion of the general which is to be accomplished by acuteness of observation. Where we wish to combine elements into a whole, the main difficulty, as a rule, is to assure

ourselves of our elements and their several relations. The construction that we form does indeed assume a generalisation, but, as a rule, one which nobody would contest. Hence the process of combining the given elements occupies the whole attention, and gets the name of Deduction, but logically it implies an inductive basis.

Ultimately, then, in both cases alike the conclusion involves generalisation from an observed case on a single axiom. It is this generalisation which distinguishes reasoning from other intellectual processes, and the various forms of the axiom of Induction are therefore the axioms of Reasoning. As to their basis I make no inquiry at present. But it is clear that they are not generalisations from evidence, for they are themselves implied in generalisation. Nor yet deductions from higher principles, for they are implied in deduction. Nor, again, are they 'assumptions' made by an 'act of scientific faith, for assumption and faith are of things wholly or in part beyond reason, and may be to some extent unwarranted; but these principles are involved in all Reasoning, and are therefore as clearly warranted as the most clearly reasoned belief. They are principles the application of which is the operation of reason, and apart from which no inference is logically justified. Finally, if we thus conceive the generalisation of particulars as the work of reason, we get a clearer conception of general truths. They are not mere colligations, stating what is or has always been observed. On the other hand, they do not state anything but what is observable. The terms connected in the universal judgment are terms that may be observed by sense or in some way presented to the mind. The relation between them is equally an observable relation. The general judgment states simply this, that terms like certain observed terms will always be found in relation to one another like the relation observed between the terms observed. We thus get universal judgments which neither deal with things apart from observation nor yet are mere summings-up of what has been, but are assertions in the spirit of an imperative of what will always be presented to the mind—assertions which result from the observation of particular facts upon definite and consistent principles.

V.—DISCUSSION.

DR. MÜNSTERBERG AND EXPERIMENTAL PSYCHOLOGY.

By E. B. TITCHENER.

THE readers of MIND have been already made so far familiar with the contents of Dr. Münsterberg's *Beiträge zur experimentellen Psychologie*, that any general introduction to the present criticism is unnecessary.¹ It may suffice to recall the fact that the author's aim is threefold: the combating of an existing psychological theory; the establishing of a new psychophysical theory of his own in its place; and the testing of this latter by crucial experimentation.² From a scientific worker, attempting so difficult a task in the face of received opinion, one may reasonably require the use of scientific method; one expects to find the 'orthodox' view correctly understood and represented, the theory, which is to take its place, coherent and adequate, and the experiments, on which the new doctrine rests, exact and searching. I shall endeavour to show, so far as space allows, that Dr. Münsterberg's work leaves very much to be desired in all three respects.

Dr. Münsterberg's plan is to preface each separate research with a critical discussion of past work, and an exposition of his own theory; so that the reader comes to the experimental part with more or less of prepossession in favour of the explanation already given, and, perhaps, with the edge of his critical acumen more or less blunted. I propose here to follow the inverse method; and to ask, first of all, what sort of basis these experiments would make for the support of any theory whatsoever; recurring later on to their particular application, and to the author's polemic against Wundt.

I. Ludwig Lange, working in Wundt's Institute in 1886-7, discovered that the time of reaction to sense-impression differed considerably, according as the reagent concentrated his attention upon the stimulus or upon the reaction-movement. With sound-stimulus, *e.g.*, the "muscular" or "shortened" reaction-time would be 125 σ ; the "sensorial," 225 σ .³ Lange concluded, as regards the former, that the reaction is an involuntary, indeed reflex, movement; including neither apperception of the sense-impression, nor act of will, though occurring under the influence

¹ See the Editor's two articles: MIND, xv. 234 ff., 524 ff.

² *Beiträge*, i. p. viii.

³ L. Lange, "Neue Experimente ueber den Vorgang der einfachen Reaction auf Sinneseindrücke," *Phil. Studien*, iv. pp. 492, 493.

of the previous impulse of will, which innervated it. Wundt also explains the process as a brain-reflex; and, accordingly, denies it all value in the investigation of the more complicated psychical processes.¹ It is this latter proposition which Dr. Münsterberg disputes. He seeks to prove that the shortened reaction can occur where such higher processes are concerned, and where there can be no question of the effect of habit; so that the "more complicated choice-movements are also simply brain-reflexes".² On this basis he proceeds to experiment.

The more obvious procedure would surely be the raising of the previous question. If the muscular reaction is applicable in cases where we are dealing with the time-measurement of acts of choice, &c., is it a brain-reflex? Dr. Martius, who has carefully investigated this latter point (without regard to the 'if'), gives a negative answer.³ And Dr. Münsterberg appears to be unable to reply to his criticism; which must be met, unless the whole hypothesis is to fall to the ground.⁴

The general method of experimentation in this research has been described by the Editor in his first article.⁵ It is hardly so exact as it should have been, considering the author's polemical purpose. Thus, Dr. Münsterberg maintains that he was able, as experimenter, to call out the stimulus-word, and close an electric key, "with exact simultaneity".⁶ This can, of course, only have happened by chance. What the error would be one cannot say; but it must have influenced the results, and it need not have been constant.⁷ Still more glaring is the inexactitude when Dr. Münsterberg speaks as reagent.⁸ On p. 73 we are first told that there was no perceptible difference in the reaction-times of the different fingers; and, in the next paragraph, that the difference disappeared "with some practice". What were the differences? And how many experiments constituted practice? Movements of two fingers for one often occurred; but the results so obtained were turned to account by the application of an exceedingly doubtful criterion.

Even if the above-mentioned time-error were constant,⁹ Dr. Münsterberg's figures could not claim much credit. The proportion of error in one part of the work done with Dr. Thumb amounted to 30 per cent.; in another to 25 per cent.¹⁰ It would be in any case dangerous to build conclusions upon such a founda-

¹ *Physiolog. Psychologie*, ii. 266, 269 (3te Aufl.). ² *Beiträge*, i. 72.

³ Martius, "Ueber die musculäre Reaction u. die Aufmerksamkeit," *Phil. Studien*, vi. 190 ff.

⁴ Münsterberg, in the *Allg. Zeitschr. für Psychiatrie u. psychisch-gerichtliche Medizin*, xlvii. pt. 6, p. 22.

⁵ *MIND*, xv. 238. ⁶ i. 69.

⁷ See tables in Külpe, "Ueber die Gleichzeitigkeit u. Ungleichzeitigkeit von Bewegungen" (i.), *Phil. Studien*, vi. 514 ff.

⁸ i. 89. ⁹ As Dr. Martius assumes, *loc. cit.*, p. 137. ¹⁰ i. 83, 85.

tion; but it is especially venturesome in the present instance: for, in the whole research, Dr. Münsterberg did not himself once react! And why is there no hint of a calculation of the "probable" percentage of error, which would enable the reader to control the numbers given?

In the second part of this research we meet with a fatal weakness as early as p. 96. A sentence is called out to the reagent, who replies by association. Where, in the course of the stimulus, does the association begin? Dr. Münsterberg quite gratuitously assumes that it does so at the end of the sentence. But it is plain that all sorts of influences, favourable or inhibitory, may be at work before the final direction is given to the reaction. In fact, it is this possibility alone (unless unusual faults in the apparatus are to be supposed) which renders certain results—*e.g.*, the round 900 σ for the colour-reaction on p. 101—at all intelligible.

We are, then, forced to the conclusion that the experimentation is too inexact and incomplete (in the first research 800 experiments served for 7 groups, each with 5 categories; in the second 800 for 10 groups)² to stand as the basis for a theory. On this ground alone, therefore, it would be impossible to regard Dr. Münsterberg's hypothesis as in any sense verified; even had not Dr. Martius obtained quite different results with the same method.³ But, apart from this, another explanation of the figures lies to hand; and is, indeed, partly indicated by the author himself.⁴ In spite of assertions to the contrary, we plainly are dealing here with "automatic co-ordinations"; the large number of errors being explicable by the imperfection of the previous practice.⁵ We are thus enabled to explain the large figures obtained with false reactions (p. 77); the figures and error-percentage in the fourth group of experiments with Dr. Thumb (p. 82); and the "surprisingly small" figures in the fourth group of the second half of the research (p. 97). Some difficulties, no doubt, remain: but then the author does not even inform us, *e.g.*, if he makes use

¹ i. 69; cp. 117.

² i. 86, 105.

³ *Loc. cit.*, pp. 167 ff. Dr. Münsterberg's reply consists of two statements and an analogy (*Zeitschr. f. Psychiatrie, loc. cit.*): (1) individual differences exist; (2) one positive case is worth ten negative ones; (3) colour-blindness does not tell against a colour-theory.

⁴ i. 76, 81, 83, 84, 85.

⁵ The figures, as they stand, Dr. Martius frankly gives up. He suggests *Einstübung*, as explaining a good deal; but emphasises the fact that the report of the experiments is too inexact to allow them to be properly controlled. The times of the experimentation, the control-times, and the mean variations are either not at all, or but incompletely, given. (*Loc. cit.*; pp. 177-8. Cp. J. Sully in the *Academy* of Aug. 16, 1890, p. 135. Mr. Sully makes the "preliminary mental concentration" too complete. For the author's denials, see i. 67, 71, 72.)

of false reactions in estimating mean times, or excludes them in Wundt's way.¹

II. Although the method of experimentation in the research upon Time-sense (*Beitr.* ii.) is in essential that proposed by Wundt,² Dr. Münsterberg has contrived to introduce here also a sufficiency of sources of error. The modifications described are not very reassuring;³ and the author appears to have forgotten that a hammer takes some time to fall. In any case, where are the figures? What was the total number of experiments made? How great was the constant error? What were the variations? How is the over-estimation of larger times and the under-estimation of smaller, or the fact of periodicity, to be explained? Until these questions are answered, it is impossible to control the research; and the answers in the text are hopelessly incomplete.⁴

Dr. Münsterberg's theory, which the Editor has made clear for him in *MIND*,⁵ is by no means so clear in the *Beiträge*. We are expressly told, *e.g.*, that the direction of the attention upon a period of time is nothing more than the consciousness of our sensations of strain, and of the alterations in their intensity, during that period. Yet the attention is focussed upon these sensations of strain in order that we may measure the time.⁶ Worse than this, the act of attention is itself explained by means of muscular sensations: so that we somehow manage to concentrate a sensation of strain upon another sensation of strain. Or, to speak more accurately, the condition of the psychophysical organism at the moment is that of one sensation of strain directed upon another! The idea of Time arises from the synthesis of sensations of strain, and the sensations occasioned by the stimuli which limit time-periods;⁷ so that a "pause," in which there is no such sensation, is "timeless".⁸ And the time-sense having been reduced to terms of strain-sensation,⁹ Time finally disappears altogether; while the fact that our judgment of periods is more precise when the limiting stimuli affect the ear than when they act upon the eye is explained by the help of the hypothesis that the excitation encounters less resistance in travelling on the "reflex path between ear and muscle".¹⁰ But light-impressions have a prolonged after-effect; which is absent in the case of sound-stimuli.

When we are thus getting well rid of the time-element in the time-sense, it is a little puzzling to find the state of respiration and of strain spoken of as the subjective *condition* of comparison of time-intervals—as being of *influence* upon our estimation of time.¹¹ Indeed, while recognising the service which Dr. Münsterberg has done in calling attention to this influence (to which he should, perhaps, have added that of heart-movement and pulse),

¹ i. p. 35.

² *Phys. Psych.* ii. 357.

³ ii. 61.

⁴ Pp. 63, 65, 66.

⁵ xv. 529 ff.

⁶ P. 25; cp. pp. 20, 26, 67; and et. p. 23 with p. 37.

⁷ Pp. 25, 29.

⁸ P. 38.

⁹ P. 45.

¹⁰ P. 49.

¹¹ Pp. 44, 66.

the reader cannot but wish that he had taken trouble to express his general view a little more clearly. And in any attempt to explain the experimental results it must be borne in mind that the author alone reacted throughout the investigation.¹

III. In the description of the experiments made upon "Fluctuations of Attention" a similar carelessness of expression occurs. The stimulus employed—a grey ring on a white ground—corresponded to the threshold of difference.² Nevertheless, Dr. Münsterberg speaks of the "different maxima of intensity," and of the "varying intensities of sensation"—by which he means its presence or absence.³ Because the appearance and disappearance of the ring was accompanied by the feeling of weak movements in the eye, it is assumed that such movements actually took place.⁴ The group of experiments in which the reagent held in his left hand a pair of prismatic spectacles, which he brought at intervals before the eyes, seem to be of doubtful value.⁵ The author writes that all went well "with a little practice"; but one would like to know if the strong tendency to head-movement was observed and checked. The remarks dealing with indirect vision⁶ should never have been written; and would not have been had Dr. Münsterberg taken the trouble to experiment with a white stimulus on a dark ground. The phenomenon in this case is, in reality, precisely similar to that observed with the grey ring. This latter, again, is in no sense of the word a "minimal" light-stimulus.⁷

The fluctuations are referred to the varying conditions of fixation and accommodation. Why was not this hypothesis experimentally investigated? If no phacoscope was at hand, the simple plan could have been followed of throwing a double-image upon the rotating disc, and observing whether the distance between its two parts varied with the fluctuations of the grey ring. But the incorrect assumption is preferred. And what physiological ground is there for supposing that the exhaustion of the muscles acts as a reflex stimulus upon fixation and accommodation? The theory is arbitrary to the last degree.⁸

IV. An error common to all published investigations upon Eye-

¹ P. 63.—The strange confusion about inspiration and expiration, on p. 36, may be noticed here.

² "Der Ring, . . . bei gespannter Aufmerksamkeit noch gerade eben merkbar"; and "den eben noch merklichen Ring," ii. 85; cp. 100.

³ Pp. 84, 85. ⁴ P. 86. ⁵ P. 87. ⁶ P. 100. ⁷ P. 109.

⁸ Dr. O. Külpe has pointed out to me that Dr. Münsterberg's theory shows ignorance of the fact that sensibility to difference is finer when the eye is moved than when it is at rest (cp. *e.g.*, Helmholtz, *Phys. Optik*, 315). The value of the just perceptible difference being different for the two cases, we can explain the absence of fluctuation in the former; for the ring which for the resting eye is just perceptibly different from its background would, if the eye were moved, more than just perceptibly differ from it.

measure is that of disregarding the *place* of that portion of the retina upon which the spaces compared fall. In this respect Dr. Münsterberg is no better and no worse than his predecessors. A curious mistake is made on p. 155, where the province of the method of minimal changes is suddenly and unaccountably limited.¹ For the rest, the subject is an easy one; no new theory is propounded; and the path of research has been pretty effectually smoothed by Volkmann and his successors.

V. The next subject dealt with is the Space-sense of the Ear; a part of Dr. Münsterberg's work which Mr. Sully describes as "especially valuable".² The author's theory is that the localisation of a sound consists in the assigning to the sensation of the reflex movement which is necessary to turn the head to the source of sound its proper place in the whole system of sensations of head-movement.³ His experimental method is as follows. Round a common centre (the middle point of a line joining the two tympanic membranes) three circles of two metres' diameter were drawn, whose planes intersected one another at right angles. The difference-threshold for localisation was then determined at various points upon each circumference. The stimulus was the noise obtained by turning the button of a keyless watch. A detailed description of the apparatus is withheld.⁴

The threshold was determined at sixteen points on the circumference of the horizontal circle; but as the data obtained from the right and left semicircles gave "almost exactly symmetrical" results, only nine sets of figures are tabulated. A fairly constant progression was found, from 1.5 cm. at 0° before the face, to 10 cm. at 180° behind the head. The figures obtained from the frontal circle, whose 0° point lay above the head, are about 2 cm. for 90° and 270°; about 3 cm. for 0° and 180°; between 6 and 8 cm. for 45°, 135°, 225°, and 315°. The 0° point of the sagittal circle coincides with that of the frontal. The degrees follow the clock, as the observer stands facing the right side of the reagent. The threshold was found to be 1 to 2 cm. at 0°, 135°, 270°; rather larger at 45° and 180°; 4.5 to 5 cm. at 90° and 225°; 17 to 18 cm. at 315°.⁵

Dr. Münsterberg's theory of Localisation is, as he himself admits, very different from those of most physiologists and psychologists.⁶ But the exactness of his results (the largest threshold extending to only about one thirty-fifth of the whole circumference) is so surprising that one is at first sight tempted to

¹ See Wundt, *Phys. Psych.* i. 350, 351. Cp. G. E. Müller in *Göttingische gelehrte Anzeigen*, 1891, No. 11, p. 419. I content myself with this single reference to Prof. Müller's annihilating criticism of the *Beiträge*. The present article was written before the June number of the *Anzeigen* appeared; and the two reviews to a large extent cover the same ground.

² *Academy*, loc. cit., p. 136.

³ Pp. 197, 215.

⁴ Pp. 217-9.

⁵ Pp. 220, 226, 229.

⁶ P. 183.

take his explanation of them on trust. He has, however, overlooked the significance of the fact that the circles cut one another at various places. If we tabulate the results thus comparatively, we obtain the following equations (in which H stands for the horizontal, S for the sagittal, and F for the frontal circle; and the degrees are reckoned according to the author's directions, pp. 219, 225, 228):—

$$\begin{aligned} 0^\circ, 1.5 \text{ cm. } H &= 90^\circ, 4.5 \text{ to } 5 \text{ cm. } S. \\ 180^\circ, 10 \text{ cm. } H &= 270^\circ, 1 \text{ cm. } S. \\ 270^\circ \text{ or } 90^\circ, 7.5 \text{ cm. } H &= 90^\circ \text{ or } 270^\circ, 2 \text{ to } 2.5 \text{ cm. } F. \\ 0^\circ, 3 \text{ cm. } F &= 0^\circ, 1.5 \text{ cm. } S. \\ 180^\circ, 2.5 \text{ to } 3 \text{ cm. } S &= 180^\circ, 3.5 \text{ cm. } F. \end{aligned}$$

The large differences in the first three lines of this table can hardly be explained by variations in sensations of strain; for the sensation of strain would be practically the same for each side of each equation. And the occurrence of the large threshold, 17 to 18 cm., at 315° of the sagittal circle (between $270^\circ = 1$ cm., and $360^\circ = 1.5$ to 2 cm.) Dr. Münsterberg does not attempt to account for: he merely remarks that it is "striking".¹

Once more, therefore, facts and interpretation cannot be accepted as they stand. "One cannot resist the opinion," as Dr. Münsterberg himself is wont to say, that the reagents in this research judged simply according to the *intensity* of the stimulus; and that this process was regarded as a direct judgment of locality.² Such a theory would serve to explain the irregularities

¹ P. 230.

² Dr. Münsterberg has left the careful experimentation of Docq (*Mémoires couronnés par l'Académie de Bruxelles*, xxiv. 1870, "Recherches physico-physiologiques sur la fonction collective des deux organes de l'appareil auditif") altogether unnoticed. Comparing Docq's curve (p. 22) with Dr. Münsterberg's (horizontal) results—so far as is possible, where the methods employed are so different—I can only find agreement between them at 180° , doubtfully at 45° , and vaguely between 105° and 165° . On the front semicircle the discrepancies are very large. Docq expressly refers judgment of direction to inference from the intensity of the sound; see p. 29: "Si les impressions reçues par les deux oreilles sont inégales, le corps sonore est du côté de l'organe le plus vivement impressionné . . . Si les sensations éprouvées simultanément par les deux organes sont égales entre elles, le corps sonore est sur le prolongement du plan médian de la tête." The intensity-theory is also to be found, e.g., in Ladd, *Elements of Physiological Psychology*, p. 404; Bain, *Senses and Intellect* (3rd ed.), pp. 204-5; Spencer, *Principles of Psychology*, ii. 182; cp. Wundt, *Physiologische Psychologie*, ii. 81-2. Another theory lays stress on the arrangement of the semicircular canals; see Hermann's *Handbuch der Physiologie*, iii. 2, p. 136. According to Dr. Münsterberg, the head-movement is a reflex answer to stimulation of the canals (p. 201). J. Breuer, criticising Preyer's article "Die Wahrnehmung der Schallrichtung mittelst der Bogengänge" (*Pflüger's Archiv*, xl. 596), proves the untenability of this theory. "Wenn . . . die Schallwellen immer in derselben Richtung auf die Endolymphe über-

in the figures; and accords very well with the results of the one-ear experiments, which are appended to those already noticed, and which are not explicable in Dr. Münsterberg's terminology.¹ "Striking" anomalies are probably to be partially referred to variations in the strength of the stimulus. Finally, even if all Dr. Münsterberg's figures and theory were accepted, it would remain to be seen whether the curve of minimal thresholds, which he has not attempted to construct, could be explained upon a basis of sensations of head-movement.

VI. In pt. iii. of the *Beiträge*, Dr. Münsterberg develops the theory that our estimation of the intensity of sensations depends wholly upon sensations of strain; and concludes from this that disparate sensations can be quantitatively compared.² He gives a number of experiments, which were instituted to this end, and which profess to confirm the hypothesis. As, however, he does not claim for the figures obtained any absolute value,³ it is unnecessary to enter into details as regards the method employed.

The first set of experiments consisted in the comparison of

tragen werden, wie sollen sie dann je nach ihrer Ursprungsrichtung die drei Canäle verschieden afficiren?" (*Pflüger's Archiv*, xlviii. 298; "Ueber die Function der Otolithenapparate"). Cp. p. 302, note: "Dr. Münsterberg . . . versucht so wenig wie Prof. Preyer die physikalischen Vorbedingungen begrifflich zu machen". And see von Kries, "Ueber das Erkennen der Schallrichtung" (*Zeitschr. für Psych.*, &c., i., especially pp. 248 ff.).—Early in June, Prof. H. Ambronn and Dr. Külpe kindly put themselves at my disposal for carrying out control-experiments on this subject. Dr. Münsterberg's directions for the horizontal circle were followed throughout. Prof. Ambronn, who is completely deaf in the left ear, reacted without any previous knowledge of the method of procedure. The results of the experimentation in his case may be summed up as follows: (1) Before and behind were confused. This very common experience is totally inexplicable by the theory of sensations of movement. (2) The sound was often localised in a wrong plane. The noise from the watch at 160°, *e.g.*, was referred to the zenith; that from 345° was placed high up, above 15°. (3) The thresholds were very much larger than those of the table on p. 231. (4) The judgment of direction was unhesitatingly referred to the strength or weakness of the sensation. (5) The results were frequently quite irregular.—Dr. Külpe and myself, whose hearing is normal, found the same to hold of us. (1) and (2) were especially pronounced in my own case. We obtained no threshold lower than 10 cm., and this very uncertainly, the direction in which the sound was travelling being often mistaken. About (4) we were not so clear as Prof. Ambronn; our judgment appearing in many cases to be quite immediate. This is, however, readily intelligible. In connexion with (5), we more than once noticed variation in the objective strength of the stimulus. It would, therefore, seem that Dr. Münsterberg's was a *wissenschaftliches Verfahren* in the fullest sense; plane and direction being known.

¹ For, on his theory, the (horizontal) threshold at 90° should have been greater than that at 180°; whereas the numbers are -35, +32 and -38, +31;—*i.e.*, average 32.5 cm. and 34.5 cm. respectively: p. 231.

² iii. 57.

³ P. 61.

light-, weight-, and sound-stimuli with movements of the arm; a constant and a variable stimulus being in each case correlated with a constant and a variable arm-movement. Increase of stimulus was found in every case to be attended by increased arm-movement.¹ Secondly, light-, weight-, and sound-pairs are compared, in the same way and to a similar result, with space-magnitudes (*Punktdistanzen*).² Then the light-, weight-, and sound-pairs, which have been equalised by eye-measurement, are comparatively tabulated; and afterwards directly compared with one another by experiment.³ The calculated results are here in every instance smaller than the experimental; but the general outcome is the same. Finally, two tables give the issue of experiments in which the pairs of sensations compared belonged to the same sense.⁴ It is here that Dr. Münsterberg's theory decisively breaks down; as is pointed out by Dr. Martius, in his admirable review of the research filling pt. iii.⁵

Dr. Martius's criticism is, indeed, so exhaustive that one cannot do much more than repeat him in dealing with this portion of the *Beiträge*. His arguments are shortly as follows: (1) Muscle-sensations do not only differ in their time- and space-relations, as Dr. Münsterberg declares; and, if we owe our recognition of differences of space and time to muscle-sensations, we cannot refer differences of intensity to muscle-sensations which are already temporally and spatially different. (2) According to the theory, the whole sum of possible sensations should form a single intensive series; that they do not is shown by the necessity of taking an arbitrary starting-point for the comparison of disparate stimuli. (3) The key to the experimental results is the fact of the relative difference-threshold; which supplies consciousness with an unit of comparison. Dr. Martius writes: "The fact of the difference-threshold forces us to the conclusion that between any two points of the ascending stimulus-scale there is always and alone possible a numerically definite succession of intensively graduated sensations; while the stimulus increases continuously. . . . The interspace between two sensations of different intensity, which belong to the same sense, may be called a psychical distance. . . . Such a distance would be naturally measured by the number of possible sensations (determinable by the threshold of difference) which it includes: the greater their number, the greater the distance. One can thus say of Münsterberg's experiments that they are concerned with the inter-

¹ Pp. 72-3.² Pp. 77-8.³ Pp. 81, 82-3.⁴ P. 85.

⁵ Martius, *Zeitschrift für Psychologie u. Physiologie der Sinnesorgane*, i. 203. A special error in these experiments is pointed out by Prof. F. Angell, in an as yet unpublished investigation:—"Es ist . . . zu bemerken dass, in der Berechnung der Lichtempfindungsäquivalente aus Scheibenversuchen, Münsterberg die Proportionalität von Helligkeit und Gradzahl der weissen Sektoren angenommen hat; was keineswegs der Fall ist" (cp. *Beiträge*, iii. 88).

comparison of different psychical distances. Such a comparison . . . could only be exact if there were one definite starting-point for the determination of all possibilities of sensation."¹ The evenness of Dr. Münsterberg's results is to be explained by the fact that he "operated with but comparatively few and very distinctly different stimulus-pairs".

Dr. Münsterberg's polemical aim is the demolition of a *soi-disant* "theory" or "metaphysic" of Apperception.² Like pulpit atheism, this theory is a thing of straw, which the author sets up and knocks down with a wearisome monotony. The serious part of the matter is that he has fathered the "metaphysic" upon Wundt, and has so succeeded in leading others into error.

According to Wundt, consciousness at any moment is the sum of the mental processes then existent.³ The ultimate elements of all psychical processes are three: (1) the pure sensation; (2) the tone of feeling attaching to it; and (3) apperception. Our ideas, therefore—complexes of (1) and (2)—present themselves to consciousness as the results of our own activity.⁴ Whatever Wundt's apperception-theory is, therefore,—and space does not allow of anything like a full discussion,—it certainly is not a theory of a power, external to consciousness, acting upon conscious content.⁵ Yet this is the view which Dr. Münsterberg would fain have us believe he has found in the *Physiologische Psychologie*! It is, on the contrary, the case that his elaborate description of consciousness contains elements which are completely foreign to Wundt's doctrine: since, as was stated above, there is no place in this for a *Bewusstseinsform*.⁶ It is clear that Dr. Münsterberg has been misled by the well-known Parable of the Eye in Wundt's preliminary discussion of Attention and Will; but this only shows how dangerous it is for an author to endeavour to aid his readers by means of an analogy.⁷

The number of passages in which Dr. Münsterberg represents the Wundtian apperception as a foreign power, which arbitrarily invades the content of consciousness, is legion.⁸ In several

¹ *Loc. cit.*, 205-7.

² *Beiträge*, i. 89.

³ See "Ueber die Methoden der Messung des Bewusstseinsumfangs," *Phil. Studien*, vi. 250: "Nicht ein seinem Inhalt selbständig gegenüberstehender Thatbestand ist aber das Bewusstsein, sondern lediglich dieser Inhalt selber". *Cp. Phys. Psych.* ii. 226.

⁴ See *System der Philosophie*, pp. 380 ff., especially p. 385: "Damit wird das Vorstellen zu einem Geschehen, welches wir zugleich als unser eigenes Thun auffassen".

⁵ *Cp. Külpe*, "Die Lehre vom Willen in der neueren Psychologie," *Phil. Studien*, v. 427 ff.

⁶ *Beitr.* i. 31, 38-41.

⁷ *Phys. Psych.* ii. 235-6; *Beitr.* i. 35, ii. 70.

⁸ I cannot be sure that I have noted them all, but the following are the most obvious: i. 45, 50, 52-3, 107, 112, 159; ii. 1, 62, 100-1, 111, 122-4, 134-5; iii. 1, 120, 122. Mr. Sully has noticed this misrepresentation; *loc. cit.*, p. 135.

places he triumphantly refutes his straw-man, leaving the real apperception-theory absolutely untouched.¹ And this attitude leads to further complications of error. When, e.g., the author declares that the results of Dr. Thumb's research are irreconcilable with the apperception-hypothesis, and had been pronounced to be so beforehand by Wundt, he forgets that the "shortened reaction" in the two cases is not the same thing. While Wundt presupposes that the attention is wholly concentrated upon the reaction-movement, for himself it is directed at once upon motion and stimulus.² Again, "apperception in the narrower sense" is not the "associatively occasioned idea arising from the fusion of stimulus-idea with the various strain-sensations of attention ('that which I hold fast is the word so-and-so'),"—but attention itself.³

Nor do Wundt's pupils fare much better. His whole "school" is said to be divided by heterogeneous apperception-theories: the whole literature of the "physiologico-psychological apperception-psychology" shows a purposed avoidance of the real difficulty of psychophysics.⁴ It is a little confusing to be told that one is at variance with people with whom one had imagined oneself to be on the friendliest terms; and it is only fair that Dr. Münsterberg should be asked to give references for his statements.

To come to particulars. In criticising Ludwig Lange's research, in pt. i., Dr. Münsterberg expresses the opinion that the length of the "extreme sensorial" reaction was due to the intervention of an act of reflexion, and not to the changed direction of the attention.⁵ A few pages later he makes the assumption that the times in another set of reaction-experiments are to be explained by a particular application of "Wundt's apperception-theory" on the part of the reagents.⁶ Both suggestions are purely gratuitous and ungrounded. Again, the reader of the *Willenshandlung*, who is also acquainted with Dr. Külpe's criticism, will be hardly less than amazed when he reads the counter-criticism in the *Beiträge*.⁷ One can only suppose that Dr. Münsterberg's description of consciousness has satisfied him so well that he judges everything by its standard: though this, indeed, is no excuse for the tone he adopts. Lastly, the wholesale depreciation of the Leipsic work on the Time-sense is surely unjustifiable.

Two other points must be noticed in this connexion. The experiments of von Kries, which are quoted in support of the author's interpretation of Lange's sensorial reaction-times, had

¹ Cp. i. 112, 118, 121, 169, 172.

² *Phys. Psych.* ii. 265, 269; *Beitr.* i. 110-1, cp. 114.

³ i. 162-3.

⁴ i. 28, 45, 49.

⁵ i. 75. The author has apparently forgotten his own experiments upon the length of the reflexion-reaction.

⁶ i. 79; Merkel, "Die zeitlichen Verhältnisse der Willensthätigkeit," *Phil. Studien*, ii. 73 ff.

⁷ Külpe, *Die Lehre vom Willen*, &c. (1888), pp. 53-66; *Beiträge*, i. 158-9.

been already discussed by Wundt. It is in the highest degree probable that the short times which von Kries obtained for reactions involving an act of distinguishing depend simply upon automatic coordination. So far from proving, therefore, that Lange's reactions included an act of reflexion, von Kries's results only serve to emphasise the influence of practice in researches of this kind. The pit which was dugged for another, Dr. Münsterberg and his choice-times are fallen into it themselves.¹ And, secondly, Goldscheider's careful investigation into muscle-sense is handled with an audacity which one cannot but admire. Its main conclusion does not fit in with the theory of the *Beiträge*. But Dr. Münsterberg undauntedly subsumes it to his own view; and, in doing this, does away with it altogether! Of four possible causes, one is shown to be the true cause: whereupon it is declared that this only means, that all four are variously active in producing the result. The passages must be read to be believed.²

¹ ii. 75; von Kries, "Ueber Unterscheidungszeiten," *Vierteljahrsschrift für wiss. Philosophie*, xi.; Wundt, *Phys. Psych.* ii. 324.

² ii. 20-1, iii. 31. Goldscheider, "Untersuchungen über den Muskelsinn," *Du Bois-Reymond's Archiv für Physiologie*, 1889, pp. 369 ff. (especially pp. 495 to 502):—"Für die Perception der feinsten Bewegungen die Muskeln . . . sind sicher ohne Bedeutung" (p. 495). "Die Dehnung, bez. Erschlaffung, welche die zwei articulirende Knochen verbindenden Muskeln erleiden, ist bei gleichem Drehungswinkel verschieden, je nach der gegenseitigen Lage der beiden Knochen" (p. 496). On the theoretical side, cp. Müller and Schumann, "Ueber die psychol. Grundlagen der Vergleichung gehobener Gewichte," *Pflüger's Archiv*, xlv. 37 ff., especially p. 65:—"In keinem Fall ist mit einer und derselben Reizung der sensorischen Fasern des in Betracht kommenden Muskels oder vielmehr Muskel-complexes stets eine u. dieselbe Lage des Gliedes verknüpft; was doch erforderlich sein würde, wenn eine brauchbare Association zwischen Muskelempfindung (oder vielmehr Muskelempfindungscomplex) und Lagevorstellung sich ausbilden sollte". The Editor appears not to have recognised the decisiveness of Goldscheider's results in this connexion; and so to have allowed himself to be misled by Dr. Münsterberg's representation (*MIND*, p. 525). Both he and Prof. Horsley (*Nineteenth Century*, June, 1891, p. 857) ascribe to Wundt an interpretation of the "feeling of effort" or *Innervationsempfindung*, which is not to be found in the third edition of the *Phys. Psych.* (see ii. 404). Prof. Horsley, in the same article (p. 859), describes the result of Goldscheider's work as the "differentiation of the elements of muscular control"—comparing it with that of Münsterberg and Aubert. This description cannot have been meant to be exact. [Shortly after referring as I did to Wundt's *Innervationsempfindung* in *MIND* xv. 525, I found to my regret that I ought not to have omitted to consult the latest edition of the *Phys. Psych.*, in which his earlier doctrine is no longer maintained. As to Goldscheider's research, having unfortunately not even yet been able to read it, I have still no right to a definite opinion, one way or other, on its "decisiveness"; but the various references to it that I have seen lead me to doubt whether he has been more careful than the other inquirers to make that distinction between "Muscular Sense" and "Sense of Movement" which, as more than once urged in *MIND*, seems to me of fundamental importance in the case.—EDITOR.]

Dr. Münsterberg's application of his experimental results is threefold. Those of pt. i. serve as the basis of his Association-theory; those of pt. iii. as the basis of a new theory of the measurement of Intensity (for this is what the "Neue Grundlegung der Psychophysik" consists in);¹ and the whole series of researches, forming practically a psychology of the Muscle-sense, is interpreted as a confirmation of his general psychophysical theory—the conditioning of the psychical by the physical.² The discussion of Association has been touched on by the Editor.³ Dr. Münsterberg has published experiments bearing upon the question in the *Zeitschrift für Psychologie*, but results and interpretation are too doubtful to help his theory. One would like to know, as a matter of curiosity, whether the sensations of innervation on which one's logical thinking depends are memorial representations of the muscle-sensations of the Time-sense investigation,—which can alter in intensity; or of those of the "Neue Grundlegung,"—which cannot.⁴ The theory that intensity of sensation is measured by means of muscle-sensation or sensation of movement has already been incidentally discussed. It has been pointed out that it involves a circle; while it was elsewhere shown that Dr. Münsterberg's general idea of the muscle-sense is in conflict with ascertained physiological fact. And even if the dilemma were recognised, and the choice really lay between an apperception-metaphysic and his own dogmatic statement that unless muscle-sensation forms a part of conscious content there can be no consciousness of any phenomenon whatever,⁵ one would be inclined to prefer the former, as the less audacious position of the two. The more general psychophysical theory must occupy us a moment longer; for the passages in which it is referred to in the *Beiträge* furnish yet another example of the looseness of the author's manner of writing.

¹ Cp. Martius, *loc. cit.*, p. 206.

² Martius, p. 199; O. K. in Zarncke's *Literarisches Centralblatt*, May 16, 1891, p. 711; Stumpf, *Tonpsychologie*, ii. 559.

³ *MIND*, xv. 244-5.

⁴ i. 160, &c., ii. 26, iii. 32; *Zeitschr. f. Psych. und Phys. der Sinnesorgane*, i. pt. 2, pp. 99 ff. "Die Association successiver Vorstellungen". Where so many have sinned,—some in the face of their own definitions,—it is, perhaps, unfair to find fault with Dr. Münsterberg in particular, but why does he so often talk of *Empfindung* and *Gefühl* as if the terms were interchangeable? English writers, like Prof. Bain and others, are partially excused in such confusion by the poverty of the language (cp. Scripture, "Zur Definition einer Vorstellung," *Phil. Stud.* vii. 221). Would it not be possible, in this special case, to avoid much ambiguity by the introduction of a verb "to sense," as = *empfinden*? The word is commonly employed in New England; and the Editor has called my attention to the fact of its use by so good an English writer as Laurence Oliphant, in 1872 (see Mrs. Oliphant's *Memoir of Laurence Oliphant*, ii. 101)—doubtless borrowed by him from his American associates.

⁵ iii. 112: "Wo keine Muskelempfindung in den Bewusstseinsinhalt eingeht, da verschwindet überhaupt jedes bewusste Erlebnis".

In his *Willenshandlung*, psychical phenomena are regarded as conditioned throughout by their physical substrate. "All conscious content . . . consists in sensations. Every sensation has its material condition in the excitation of the ganglion-cells of the cerebral cortex."¹ Yet, in the opening pages of the *Beiträge*,² we are forbidden to think of this conditioning as in any way causal; "the idea of a causal connexion is here quite unjustifiable". It is rather the case that the "material changes produced in the brain by physical stimulation of a sense-organ . . . have a psychical inner side; so that this excitation of the ganglion-cells is the condition of the appearance of a certain sensation in consciousness, while nothing of its physical consequence is lost". The sensation is the "attendant phenomenon of a definite physiological process; its appearance following necessarily from the presence of the physical conditions".³ Now the use of the word "condition" (*Bedingung*) certainly implies the existence of the causal nexus which the author denies. If, however, we are to pay more regard to the negation, then we are left with a mere casual connexion between mind and brain, and a dogmatic assertion that the processes of the former make no drain upon the physical energy which excites the latter.

Dr. Münsterberg has deserved well of the science, in so far as his publications have given a great impetus to work in Germany, America, and England. In Germany the criticism has been almost without exception hostile: Prof. James has welcomed anti-Wundtian doctrines with open arms: while in England the subsumption of the whole mass of German results under traditional English theories was a project with which our own psychologists could not but sympathise. With these facts in mind, I have endeavoured primarily to show that, whether the theories of the *Beiträge* stand or fall, their experimental foundation has very little positive worth. Dr. Münsterberg has the fatal gift of writing easily—fatal especially in science, and most of all in a young science, where accuracy is the one thing needful. At least once he contradicts himself in successive paragraphs; and at least once an hypothesis at the top of a page has become certainty at the bottom.⁴ Psychophysics will not gain by this manner of exposition. One must have the dry figures and circumstantial details which render it possible to control an investigation, and which stand fast when called on to bear the weight of a theory. The literature of such a science should make no pretence to be otherwise than special and difficult. What Byron said of "easy writing" is too hackneyed to quote, but it has a serious application to these three parts of Dr. Münsterberg's *Beiträge*.

¹ P. 140.² i. 18, 19.³ i. 39.⁴ i. 73, 88.

ON THE ORIGIN OF MUSIC.

By HERBERT SPENCER.

A few words from me in comment upon the criticisms of Dr. Wallaschek and Prof. Cattell, in *MIND* No. 63, seem needful to prevent the spread of misapprehensions.

Possibly without intending it, Dr. Wallaschek leaves his readers to suppose that I do not recognise, or do not adequately recognise, rhythm as an essential component of music. But the following passage will show, not only that I fully recognise it, but that I trace it back to the sources he indicates :—

“Even the *rhythm*, which forms a remaining distinction between song and speech, may not improbably have a kindred cause. Why the actions excited by strong feeling should tend to become rhythmical is not obvious, but that they do so there are divers evidences. There is the swaying of the body to and fro under pain or grief, of the leg under impatience or agitation. Dancing, too, is a rhythmical action natural to elevated emotion. That under excitement, speech acquires a certain rhythm, we may occasionally perceive in the highest efforts of an orator. In poetry, which is a form of speech used for the better expression of emotional ideas, we have this rhythmical tendency developed. And when we bear in mind that dancing, poetry, and music are connate—are originally constituent parts of the same thing—it becomes clear that the measured movement common to them all implies a rhythmical action of the whole system, the vocal apparatus included; and that so the rhythm of music is a more subtle and complex result of this relation between mental and muscular excitement.” (*Essays, &c.*, lib. edit., vol. ii. p. 413).

But Dr. Wallaschek differs from me by concluding that “the origin of music must be sought in a rhythmical impulse in man”; and that “men do not come to music by way of tones, but they come to tones and tunes by way of the rhythmical impulse”. In this view I cannot coincide, for the reason that it regards music as acquiring its essential character by a trait which it has in common with other things, instead of by a trait which it has apart from other things. While music must be classed as one of sundry rhythmical products, it becomes music only by that which distinguishes it from the other rhythmical products. This is clearly shown in the contrast between spoken verse and song. Both are rhythmical, but spoken verse does not become song by any development of rhythm. It becomes song by the inclusion of an element additional to rhythm. It may be admitted that the combinations of tones are moulded into a rhythmical form, at the same time that it is contended that in the absence of combinations of tones there is no music.

Is it that Dr. Wallaschek has read only my recent article in *MIND* No. 60, and has not read, or has not recently read, the original essay on “The Origin and Function of Music”? It would almost seem so from one of the objections he raises, which runs thus :—
“Music is an expression of emotion, speech the expression of

thought. If we assume that music originates in, and is developed from, speech, we must also assume that emotion is developed from thought." The misleading influence of a wrong name is well illustrated in the objection thus raised. The name "speech-theory" was used by Mr. Gurney in his argument against me: whether previously used I do not know; but it is a name which has received no countenance from me. Though it is not true that speech is "the expression of thought" exclusively, since the cadences which ordinarily constitute part of it habitually express feeling, yet the intellectual element is so dominant that the emotional accompaniment is scarcely suggested by the word. As used by Mr. Gurney, "speech-theory" seemed to me very much a nickname; and it has now proved to be a mischievous nickname, as will be seen by the following extracts from my original essay:—

"All speech is compounded of two elements, the words and the tones in which they are uttered—the signs of ideas and the signs of feelings. While certain articulations express the thought, certain modulations express the more or less of pain or pleasure which the thought gives. Using the word *cadence* in an unusually extended sense, as comprehending all variations of voice, we may say that *cadence is the commentary of the emotions upon the propositions of the intellect.*" (*Essays*, &c., lib. edit., vol. ii. pp. 421-2).

And the whole argument of the essay is to show that it is from this emotional element of speech that music is evolved—not from its intellectual element. For instance:—

"Thus, in respect alike of *loudness, timbre, pitch, intervals, and rate of variation*, song employs and exaggerates the natural language of the emotions." (*Ib.* 411.)

"Vocal music, and by consequence all music, is an idealisation of the natural language of passion." (*Ib.* 413-4.)

On reading these passages Dr. Wallaschek will, I think, see that the view I really hold is not touched by the objection he raises.

Turning to Prof. Cattell's criticism, I may in the first place remark that the nature of overtones (or harmonics as they were called in my early days) and their relations to the fundamental tone are not unfamiliar to me, as he may find in sundry places; among others on p. 197 of vol. iii. of my *Essays*. Prof. Cattell says:—"Mr Spencer seems to hold that nothing in a single tone corresponds to a combination of tones, and that the intervals used in music are not found in nature". That I do not hold this I have just pointed out, and I do not see any ground for the statement that I *seem* to hold it. The sentence on which Prof. Cattell bases his assumption as to my meaning is this:—

"Dependent as harmony is on relations among rates of aerial pulses, its primary basis is purely mechanical; and its secondary basis lies in the compound vibrations which certain combinations of mechanical rhythms cause in the auditory apparatus".

This sentence expresses no opinion respecting the simplicity or complexity of musical tones. It refers to tones as commonly conceived, taking no note of the overtones which give their *timbre*; and implicitly refers to the harmony produced by a combination of two or more such tones. Harmony as ordinarily spoken of, and as alone recognised in music, with which I was dealing, presupposes tones that are separately distinguishable by the ear and have something approaching to likeness of volume: a requirement which becomes obvious on perceiving how little harmony can be obtained between the note of a violin and that of a powerful organ-pipe. Though the overtones which, joined with the fundamental tone, give its *timbre*, bear to it relations like those which the notes of a chord do to one another, yet they are not recognised as producing harmony. It is true that in the dying sound of a deep-toned church bell, the overtones may be distinguished, and their harmony with the fundamental tone perceived; but in any ordinary musical tone no such discrimination is possible. To perception the tone seems simple, and in dealing with musical effects we are dealing with perceptions. Harmony, as ordinarily understood in music, and as spoken of by me, is concerned with the fundamental tones, and ignores the overtones; as is clearly shown by the fact that two notes of widely unlike instruments are said to be in unison, or in harmony, if their fundamental tones have the requisite congruity: no attention being paid to the overtones.

Of course I should willingly, could I do so, accept Prof. Cattell's view that "harmony has been developed from melody"; but I cannot see my way to do this. To establish the evolution of the one from the other, there must be found some identifiable transitions between the combinations of tones constituting *timbre*, which do not constitute harmony to our perception, and those combinations of tones which do constitute harmony to our perception; and I know of no such transitions. So far as I know (and I speak from memory, for I write far away from books), harmony commenced with the fugal repetition of a melody in ecclesiastical chants. Though the melody was the same, and the effect was produced by one choir commencing a bar or two after the other, yet the new kind of effect suddenly achieved cannot be considered as *evolved*, without stretching somewhat unduly the meaning of the word.

VI.—NEW BOOKS.

Riddles of the Sphinx. A Study in the Philosophy of Evolution. By A TROGLDYTE. London: Swan Sonnenschein & Co., 1891. Pp. xxvii., 468.

The "Riddles of the Sphinx" are man's "relation to the World, to his Cause and to his Future". The solution of the first is found in a doctrine of the ultimate plurality of real existences; of the second, in the doctrine of "a personal and finite but non-phenomenal God"; and of the third, in a theory of immortality, graduated according to the degree of consciousness attained by the soul during its past. The ultimate real existences are "spiritual entities". Before Time and the "world-process" they existed as a "chaos" of absolutely isolated and independent beings. The world-process began by a determination of the Divine Spirit to form the ultimate existences into a harmonious cosmos. From the interaction of the Deity and the many individual beings, consciousness results. The form it takes in man is consciousness of the World on one side and of the Self on the other. With the world-process Time begins; and with Time, Becoming and Evil are conjoined. Evil springs from the resistance of the ultimate Egos to the harmonising Evolution of the cosmos. The process of Evolution, through all its stages, consists in the perfecting of individual existences by their grouping into more and more perfect societies. After molecules have been formed from atoms and organisms from cells, the process is continued in the formation of animal and human societies properly so-called; the aim to which it is divinely directed being the coincident formation of perfect individuals and of the perfect societies to which they are adapted. The world-process is finite, having both a beginning and an end. At its beginning, is to be conceived the "pre-cosmic" state where no order existed; at its end, the "post-cosmic" state of perfect order and adaptation which will be attained when Becoming and Time have passed into Being and Eternity. This final state is the eternal and perfect activity of "perfected individuals in a perfect society".

The method to be adopted in philosophising is the "concrete metaphysical," opposed at once to the "abstract metaphysical" and to the "pseudo-metaphysical" methods. The abstract metaphysical method is that of Plato, and of the Platonists of all periods. It rightly seeks to explain the lower by the higher, but is wrong in its dualistic separation of the two. The pseudo-metaphysical method may also be called "physical," and is the method of those who would construct philosophy out of pure science alone. It is right in so far as it insists on the continuity of all things and rejects dualism, but wrong in trying to explain the higher by the lower. The characteristic of the concrete metaphysical method is to be consistently and consciously "anthropomorphic," explaining everything from individual existences viewed as analogous to ourselves. As principles generally compatible with the true method in philosophy, the author recognises Berkeley's "spirits" and Leibniz's "monads," together with Aristotle's concrete individual viewed as primary reality (p. 164). All other principles are either "abstractions" or attempts to explain the higher by the lower. With the true metaphysical principles, modern science, and in particular the doctrine of evolution, must be shown to be in harmony. Science must besides con-

tribute elements to the structure of philosophy, though these cannot by themselves furnish a metaphysical doctrine. The philosophical construction must give satisfaction to human hopes. To satisfy practical aspirations is indeed the final aim of philosophy. Whoever fails to solve the riddles of the Sphinx, and is logical, becomes a prey to pessimism. The pessimism which results from the "positivistic" attempt to do without metaphysics is the present motive for philosophising; as historically the motive has always been some inexplicability that troubled the unquestioning acceptance of life and the world.

Methods of philosophising to be altogether rejected are the "epistemological" and the "psychological," or direct criticism of the validity of knowledge and the powers of the mind. The only reply that can be made to philosophical scepticism is the indirect one of constructing a metaphysical scheme that satisfies all aspirations. The choice between the doctrine attained and scepticism is in the end an act of faith in one of two alternatives. On the one side, we are led from the positivistic rejection of metaphysics to philosophical Agnosticism, or the doctrine of the Unknowable; from this to absolute Scepticism, which destroys scientific along with philosophical certitude, and from this to Pessimism, or the doctrine that knowledge is practically as well as theoretically invalid, the ground of things being wholly perverse or irrational. On the other side, reconstruction of knowledge with the aid of metaphysical principles leads to a system of beliefs which, if we accept, we can regard the world as rational, or at least tending to rationality. The pessimistic conclusion of the one line of thought may be considered as a reduction to practical absurdity, and the satisfaction of our aspirations, which is attained by means of the other, as a justification of the principles adopted. There is, at any rate, no other justification.

The "reduction to pessimism" is an argument urged not only against the schools that reject metaphysics, but also against the "Panthæistic Monism" which the author sees to be the rival of his own Pluralism. The monistic doctrine is also attacked on intellectual grounds. Its principal weakness is found to be the assertion of the "real Infinite". The infinite in any admissible sense is only a potential infinity in our thought. Intellectually, the idea of an "infinite whole" is self-contradictory. Morally, the attribution of infinity to God requires that all finite individuals, being *coexistent*, should be regarded as *therefore* coequal manifestations of the divinity (p. 314); whence the absolute distinction between good and evil vanishes. To his positions here the author seems for once to attribute a greater degree of novelty than they possess; but his argument is evidently independent, and deviates in some points from that of his predecessors.

It may be said generally that the "Troglodyte's" pure metaphysics or ontology is of greater interest than the methods by which he arrives at it. Rejection of the "epistemological" and "psychological" methods marks a fundamental defect in procedure. When these are rejected the "concrete metaphysical method" seems to be describable simply as "unanalytic". The doctrine found to be common to Berkeley, Leibniz and Aristotle is really a result rather than a "method". By "Agnosticism" is not usually meant Mr. Spencer's doctrine of the Unknowable, against which the author in his discussion of the agnostic position exclusively directs his attack (bk. i. ch. 2). Biological evolution is rather vaguely conceived; and the error is committed of supposing that Mr. Spencer's wider application of the doctrine was subsequent to the Darwinian revolution in zoology (pp. 177-9). "Real infinity" is a little too easily disposed of, *e.g.*, when it is said to be inconsistent with the doctrine of evolution,

because evolution is a "process," and if a world infinite in time were engaged in a process it would "require an infinite Time to reach any given point in the process, and an infinite number of infinities to reach the present, *i.e.*, would never reach the present at all" (p. 257). By the hypothesis, the infinite time required is always given. The author seems to hold at once that Space is only ideal, and that real Space is limited. And when, in the course of his discussion of "Idealism *versus* Materialism," he says (p. 259) that "the existence of a reality outside ourselves is a fact, irresistibly attested by feeling, and one which does not require further proof," he might almost be taken for a "natural realist".

In this last sentence, however, he does not do himself justice. As we go on, we find him arriving at an idealism of his own that is not defective from its incompleteness, but only from absence of an epistemological or psychological foundation. Dualism is expressly rejected, and matter in its scientific as well as in its ordinary sense is viewed as purely phenomenal. The external world is held to be an appearance produced by the interaction of spiritual "monads". We miss a defence of the position in relation to the philosophical analysis of substance generally; but the author at least sees clearly the weakness of an attempt to found a philosophical theory on the objective assumptions of physical science. In detail, his rendering of monadism is a decidedly interesting effort of philosophical imagination. The theory of immortality, in particular, is well worked out. The essential idea here is that the "memory" of the monads always persists, but that it only begins to persist from one life to another under a personal form when a sufficient concentration of consciousness has been attained.

The interest of speculations such as his own is for the author—according to some of his opening remarks—that, if accepted as true, they furnish a complete answer to pessimism, and that without such an answer practical life in accordance with reason is impossible. Others may think they retain an interest, though practical philosophy can be constructed without them; and, in fact, the author attempts no ethical construction on the basis they supply. But where, in any case, does he find philosophic support for the view of certitude expressed at p. 19? "While science must remain conscious of all sorts of improbable and barely possible theories, seeing that they may suggest fruitful experiments and so enlarge the bounds of knowledge, philosophy, when it has once decided on the right solution, must sternly and rigorously put aside all its rivals, even though its choice was originally arrived at by a very slender preponderance." This would not be accepted by the theorists of the "practical reason," with whom the author has some affinities, any more than by scientific agnostics; if at least it implies that philosophy, having chosen, ought not to remain conscious of any doubt that affects its conclusions. Is it not also rather hasty to make rejection of pessimism depend on acceptance of a pluralist metaphysic? Among the historical systems Buddhism found its principle of explanation in the Individual and Stoicism in the Whole. Neither system is thought to be wanting in logical elaboration; yet the first is pessimistic and the second optimistic.

[T. W.]

The Insanity of Genius and the General Inequality of Human Faculty, physiologically considered. By J. F. NISBET, Author of *Marriage and Heredity*, &c. London: Ward & Downey, 1891. Pp. xxiv., 340.

Mr. Nisbet's book is mainly a collection of more or less well-authenticated facts relating to the nerve-disorders of every kind that

have accompanied genius either directly or by way of heredity. The collection itself is extensive and interesting, whatever may be thought of the interpretation. The author's position is that "genius and insanity are, in reality, but different phases of a morbid susceptibility of, or a want of balance in, the cerebro-spinal system". Or, as it is expanded in another passage: "Genius, insanity, idiocy, scrofula, rickets, gout, consumption, and the other members of the neuropathic family of disorders, are so many different expressions of a common evil—an instability or want of equilibrium in the nervous system". Genius is here taken in the widest sense, as including all the higher manifestations of the practical, as well as the scientific and artistic, types of mind. In all cases, "what runs in the blood is nerve-disorder, of which genius is the occasional outcome". The defect of Mr. Nisbet's attempted proof of this thesis is that he hardly goes beyond an enumeration of positive instances superficially in its favour. The necessity of a comparative study of men of genius and undistinguished persons is indeed glanced at in the last chapter, but that is all. For anything like scientific induction, comparison should of course have been systematic and continuous. As a preliminary to the comparative treatment, it would have been desirable to attempt some approximate *psychological* definition of genius on the one side and insanity on the other. From this the author perhaps cuts himself off by his view that scientific knowledge of mind only began with experiments in cerebral localisation; but even from the purely physiological point of view there are obvious defects in his procedure. Genius is said to consist in "morbid susceptibility" of the nervous system. But how are we to know whether any particular degree of susceptibility is "morbid" or not? According to the author, simply by the presence of genius. For example: "Such immense creative power as Shakespeare's can only be understood in connexion with a morbid impressionability". If this does not quite reveal the argumentative process, more light is thrown upon it by another position, of which use is made throughout the book. "Both short life and long life in excess are symptoms of the neuropathic condition, as, indeed, is every marked departure from the mean of existence." In other words, superiority and inferiority to the average are to be classed together as deviations from the normal; and all deviations from the normal are to be called morbid. Then again, in particular citations of facts, the thesis to be established is taken for granted in a curious way. Accomplishments or distinctions in the ancestors and connexions of men of genius are cited in support of the author's theory just as if they had already been proved to be "neuropathic". A few instances may be quoted. "Southey states that Cowper's father and uncle could both write verses—an ominous gift!" (p. 84). "Wordsworth's father was a man of 'great force of character'—a phrase which occurs with remarkable frequency in the family history of the insane" (p. 120). The "unbalanced condition of mind" of Bulwer Lytton's maternal grandfather "revealed itself in an extraordinary capacity for acquiring languages ancient and modern" (p. 128). Browning's father "possessed the significant gift of verse-writing" (p. 135). Balzac's mother "is described as a woman of 'great vivacity of mind, untiring activity, and extraordinary firmness'—phrases which, in the circumstances, are of some significance to the pathologist" (p. 135). "Among other peculiarities the elder Balzac had an extraordinary memory" (p. 136). Alfred de Musset's "mother's family appears to have been characterised by some nervous instability, his maternal grandfather having a prodigious memory" (p. 137). "Victor Hugo's mother, for her part, had also some peculiarities, being, in particular, energetic and sensitive" (p. 142).

"There was a marked strain of literary ability in Corneille's family" (p. 144). "With the insane temperament" Michel Angelo "inherited from his father longevity, both dying at the age of ninety" (p. 174). "The hereditary influences which conduced to Marlborough's disorders are indicated in the fact that his father was a man of letters," &c. (p. 194). "Of George Herbert's brothers one was a sceptical writer, the second a renowned duellist, and the third a dashing naval officer—the two last showing that courage, like so many forms of genius, depends upon a congenital want of mental balance" (p. 251). Would not all these examples seem more appropriate in an argument for "hereditary genius"? It is worthy of note that the only detailed case in which the author tries to show directly an "access of faculty along with morbid conditions" (p. 44) is much more easily explicable on the "hereditary genius" than on the "insane" theory.

Differences in the Nervous Organisation of Man and Woman: Physiological and Pathological. By HARRY CAMPBELL, M.D., B.S. (Lond.), &c. London: H. K. Lewis, 1891. Pp. xi., 388.

This is a book of investigation more than of definitive general results, but, as such, it is of great interest. Its central subject is the comparative physiology and pathology of the nervous system in men and women—one conclusion being that women are less liable to gross lesions of the nervous system, and recover more easily from nervous disease, than men. As a groundwork for the special investigation, the origin of sex in general is considered; Weismann's views being carefully discussed. Inclining, for reasons given, to the position that really *acquired* characters are not inherited, the author suggests, in distinction from Weismann, that the "germ-plasm" is not to be regarded as a homogeneous substance, but as consisting of individualised units. The ground of all secondary sexual differences he is disposed to find in extrinsic rather than intrinsic causes; and even, to a considerable extent, in extrinsic causes acting during the lifetime of the individual. In connexion always with his physiological and pathological basis, he deals very fully with the comparative psychology of the sexes; and is thence led on to general human psychology. Here he has been especially influenced by Dr. Hughlings Jackson, whose views he applies with independent grasp to the psychology of volition. In strength of will, as in general intellectual power, Man is at present, he finds, on the average superior to Woman, but this average superiority is almost wholly, if not wholly, due to training. The important difference is not in intellect or will (which largely depends on intellect) all round, but consists in the far greater "variability" of man than of woman. The difference is seen throughout the animal kingdom; in the human race it displays itself (on the positive side) in the fact that "genius of the highest order is practically limited to the male sex". These are only the author's most general points. His detailed treatment is marked by careful collection of facts, many of them the result of personal investigation, and by forcible reasoning on them at every stage. Both for the material and the stimulus it supplies, the book ought to be in the hands of all psychologists.

The History of Human Marriage. By EDWARD WESTERMARCK, Lecturer on Sociology in the University of Finland, Helsingfors. London: Macmillan & Co., 1891. Pp. xix., 644.

This is the completed work begun with a dissertation noted in *MIND*, xv. 288. Its specifically sociological character sets it outside the province of this Review, but it is not out of place to remark that the author's

equipment, logical as well as psychological, for his task is of a very exceptional order. Such an effectively mustered collection of facts bearing more or less directly on the human relation of marriage did not before exist, and the author's conclusions as to the development of the relation from its biological beginnings are in general as circumspectly as they are always independently reasoned out.

Justice: being Part IV. of The Principles of Ethics. By HERBERT SPENCER. London: Williams & Norgate, 1891. Pp. viii., 291.

The author has used his reviving strength since 1890 (after four or five years of disablement) to advance with that crowning division of his system of philosophy upon which most work remains to be done. Within the division he has chosen to follow up the introductory *Data of Ethics* with the present pt. iv.; leaving pts. ii., iii. ("The Inductions of Ethics," "The Ethics of Individual Life") to appear, as he hopes, before the close of next year, and meaning, thereafter, to complete the present beginning of "The Ethics of Social Life" with two more parts—of "Negative Beneficence" and "Positive Beneficence". The *Justice* has a special interest in relation to the *Social Statics* of forty years ago—years during which the author has not stood still either in his general way of ethical thinking or in his judgment on specific ethical topics. Critical Notice will follow (in the Second Series of MIND).

Freedom as Ethical Postulate. By JAMES SETH, M.A., George Munro Professor of Philosophy, Dalhousie College, Halifax, Canada. Edinburgh and London: W. Blackwood & Sons, 1891. Pp. 48.

For the author, "as for Kant, the question of freedom takes the form of a deep-seated antithesis between the interests of the scientific or intellectual consciousness on the one hand, and the moral and religious convictions of mankind on the other". The only hope of finding a place for real free-will is "in another than the Humian, empirical or 'psychological' account of the moral Person or Self". A negative contribution to the vindication of freedom was made by Kant when he showed that the Ego is not itself under the dominion of the categories by which it constructs the world. Hegel's and Green's attempt at a further positive vindication of freedom is found to be unacceptable in so far as it leads to a view of the self which again brings it under necessity. The suggestion is then made that perhaps Personality ought to be regarded as an ultimate term in philosophical explanation. This puts insuperable difficulties in the way of any 'monistic' explanation of the universe. but "we may still accept freedom as the ethical postulate, as the hypothesis, itself inexplicable, upon which alone morality becomes intelligible". Absolute uniformity not having been proved of human action, it is still as open to the advocate of freedom theoretically as it is necessary in view of the demands of morality, to "contend for a power of free and incalculable initiation in the self".

An Introduction to Cudworth's Treatise concerning Eternal and Immutable Morality, with Life of Cudworth and a few Critical Notes. By W. R. SCOTT, First Senior Moderator in 'Logics and Ethics,' Trin. Coll., Dublin. London: Longmans, Green & Co., 1891. Pp. xiii., 67.

The author (whom one takes to be a young man) aspires to do more justice to Cudworth than he thinks the Cambridge philosopher has yet received. He has therefore got ready for press an edition of the ethical

Treatise, and will apparently make its publication dependent on the reception accorded to this *Introduction* sent out before. He has aimed at shortness (which is well) and has therein succeeded; for, apart from a very general summary of the *Treatise* (20 pp.), his own introductory observations run to just 8 pp., and his "Critical Notes" (touching on Butler and Kant) to but 5 more. What is more to the purpose—these few pages give fair indication of familiarity with some at least of the philosophic thinkers upon whom Cudworth draws or with whom he has to be set in relation. By all means, therefore, let us have his edition of the *Treatise*. As to the biographical part, filling nearly one half, of his present little volume, one may not speak with much commendation. It has no novelty, and is crudely written (witness the "howevers" on p. 13 and the "buts" on p. 15). To speak of "Shaftesbury, Warburton, and Burnet" [which Burnet?] as representing "seventeenth century criticism" (p. 16), strikes unpleasantly; the "Whitcote" of p. 9 n. is, of course, meant for Whichcote. Generally, what strikes the author most in Cudworth (pp. v., 36), for all his overpowering burden of ancient lore, is his saturation with "the modern spirit". It is a thesis that will need very careful development in the coming edition.

Natural Theology. By BERNARD BOEDDER, S.J. ("Manuals of Catholic Philosophy"). London: Longmans, Green & Co., 1891. Pp. xii., 480.

This volume, completing the "Stonyhurst Series" of philosophical manuals (See MIND, xiv. 290), treats of the questions usually discussed in the Latin text-books under the headings of *Theologia Naturalis* and *Cosmologia*. It is divided, after an Introduction (pp. 1-7) into three books: i. "Of the Existence of God"; ii. "The Divine Attributes"; iii. "The Action of God upon this World".

Essays, Reviews and Addresses. By JAMES MARTINEAU, LL.D., D.D., &c. Selected and revised by the Author. Vols. II.-IV. London: Longmans, Green & Co., 1891. Pp. viii., 576; viii., 579; x., 608.

These volumes, completing the author's collection of his occasional writings (see MIND, No. 62, p. 285), are occupied with topics that have all, more or less, a philosophical import; but in vol. ii., designated "Ecclesiastical: Historical," the "practical bearings on human life in historic schools and organised churches" are kept more prominent, while vol. iv., "Academical: Religious," includes, with a series of college-addresses, a selection of hortatory sermons. Vol. iii., "Theological: Philosophical," contains in its first division some essays (on the general thought of Oersted, Mansel, H. Spencer and others) that might equally well have been ranged with those that make up the second. As they stand, the essays or reviews given as expressly "philosophical" are occupied with Whewell as moralist, S. Bailey as logician, Hamilton and Mill as philosophers, Bain as psychologist, and finally with the question "Is there any Axiom of Causality?" This last is raised to a great extent in connexion with Mill's treatment in the *Logic*, and generally, it may be noted, throughout the division it is Mill who, with whatever hostile criticism, receives highest appreciation. In this connexion, an incidental footnote (p. 339) to a trenchant exposure of Whewell's ethical pretensions, in 1845, has a peculiar interest: "The quietness with which this book [J. S. Mill's *System of Logic*, spoken of in the text as "a work which stands almost alone, certainly pre-eminent, among treatises on philosophical method"] has been received affords no test of its destined influence. We believe there are not half-a-dozen persons in England capable of reviewing it." Many other such observations of first-hand historic interest are here reproduced by Dr. Martineau;

and, spread as his writings have been over such a width of time, they thus acquire a value as 'documents,' over and above their intrinsic importance as philosophical judgments always sincerely argued and most eloquently expressed.

Kant's Principles of Politics, including his Essay on Perpetual Peace. A Contribution to Political Science. Edited and translated by W. HASTIE, B.D., &c. Edinburgh: T. & T. Clark, 1891. Pp. xlv., 148.

The pieces brought together under this title are, as here named, (1) "The Natural Principle of the Political Order considered in connexion with the idea of a Universal Cosmopolitical History," (2) "The Principles of Political Right considered in connexion with the relation of theory to practice in the Right of the State," (3) "The Principle of Progress considered in connexion with the relation of theory to practice in International Law," (4) "Perpetual Peace: A Philosophical Essay". They are given as a complement to the *Rechtslehre*, translated by Mr. Hastie three or four years ago (see *MIND*, xii. 301), and as the proper crown of Kant's philosophic activity.

The Time-Relations of Mental Phenomena. By JOSEPH JASTROW, Professor of Psychology in the University of Wisconsin. ("Fact and Theory Papers," No. vi.) New York: N. D. C. Hodges, 1890. Pp. 60.

A very well-filled paper, giving account of the whole range of recent experiments on the time taken up in mental operations, from "simple reactions" to acts of distinction and choice. The object is "to present a systematic sketch of what has been done, with due reference to the ultimate goal as well as to the many gaps still to be filled".

Étude sur les Arguments de Zénon d'Élée contre le Mouvement, par G. FRONTERA. Paris: Hachette et Cie., 1891. Pp. 23.

In view of the position taken up by some philosophic teachers in France, that the arguments of Zeno against motion are in part at least irrefutable and prove that it cannot be construed rationally as a reality in the metaphysical sense, the author examines all four arguments from the mathematical point of view. He finds the difficulties in the more plausible arguments (the 'Dichotomy' and 'Achilles') to be caused (1) by taking account of space and its (ideal) infinite divisibility to the exclusion of time, any finite portion of which is infinitely divisible in precisely the same sense, and (2) by arbitrarily fixing the space to be traversed.

Les Hallucinations télépathiques par MM. GURNEY, MYERS et PODMORE. Traduit et abrégé des *Phantasms of the Living* par L. MARILLIER, avec une Préface de M. CH. RICHEL. Paris: F. Alcan, 1891. Pp. xvi., 395.

The 1300 pages of *Phantasms of the Living* are here, in translation, brought down by more than two-thirds, so as to give them the better chance of winning a way with the "positive and sceptical" French mind. For, though France is pre-eminently the land of hypnotic 'subjects,' M. Richet seems to fear that "les revenants et les fantômes" are there more likely than elsewhere to be met with smile or shrug. The boiling-down, of course, could not be done without sacrificing much that was most characteristic and also most valuable in Gurney's massive volumes. Of the theoretic discussions, in which he expatiated with that large power of his, only as much is given as suffices

in any way to string together a free reproduction of the narrative "cases". Granted the principle on which the translation has been made, much praise is due to M. Marillier for his execution of a task of selection far from easy; but one abatement must be made from this acknowledgment. He nowhere states how the original work was actually composed: all of it issuing from Gurney's hand, except some 80 pp. of introduction and supplementary discussion by Mr. Myers. For want of such indication, the French reader is left to puzzle out the difference between the "je" of the (here shortened) Introduction and the "je" of the book. That is a pity; nor is the translator's oversight at all repaired by what *his* introducer says on the subject. For M. Richet, after first going the length of ascribing "une part prépondérante" in the work to Gurney, has so much regard to survivors that he straightway adds apologetically: "Je ne crois pas être désagréable à ses collaborateurs en disant que la part qu'il a prise au plan comme à l'exécution des *Phantasms of the Living* a été considérable". Upon which one can but exclaim—Considerable, indeed! Passing away from this topic, it is interesting to note that M. Marillier translates without yet being a convert to belief in telepathy, but looks for some scientific decision to the statistical inquiry which is now being carried on in different countries and which it is desired to bring to a head for the International Congress to be held in London next year. M. Richet, who may be called a believer already, pushes aside for his part both reasoning and observation (which between them must cover statistical investigation) as decisive tests, and would rely upon experiment only—experiment that should admit of indefinite repetition at will. That seems a still straiter adhesion to method of science, but one's hope of M. Richet's strenuousness is somewhat dashed by the fact that, while he plumply allows that, "malgré tous nos efforts, nous n'avons pu, ni les uns ni les autres, démontrer rigoureusement qu'il y a suggestion mentale, transmission de la pensée, lucidité, sommeil à distance," he yet does not doubt (p. x.) that the experimental demonstration, thus far absent, will soon be forthcoming—and meanwhile is, apparently, satisfied not to let his own conviction wait upon its advent.

La Philosophie du Siècle. Criticisme—Positivisme—Evolutionnisme. Par E. DE ROBERTY. Paris: F. Alcan, 1891. Pp. viii., 235.

In this book the author's philosophic doctrine set forth in *L'Ancienne et la Nouvelle Philosophie* and *L'Inconnaissable* (see MIND, xii., 620, xiv. 456) is expounded anew with developments and modifications. The three typical philosophies of the century are found to be the Criticism of Kant and his successors, the Positivism of Comte, and the Evolutionism of Mr. Spencer. All three are at bottom "metaphysical". "Scientific philosophy" is not yet founded, and we must not expect to see it founded just yet. Before there can be a genuinely scientific philosophy there must be a considerably greater development of psychology and sociology as special sciences. To-day all philosophy is necessarily metaphysical, because in trying to integrate knowledge it inevitably makes unverifiable hypotheses derived from some particular group of sciences. According to the particular group of sciences in which the key to the whole system of things is sought, is the nature of the philosophy. The Critical philosophy takes its origin from Idealism, the Positive philosophy from Materialism, and the Evolutionist philosophy from Sensualism; these three older philosophic doctrines being respectively (as was formerly contended) explanations of the universe by exclusive reference to psychical and social phenomena, to inorganic

phenomena, and to biological phenomena. The three doctrines in their present form tend to converge, and in many ways may be regarded as expressions of a single metaphysical system determined by the state of the sciences generally. (Besides, when their antecedents are strictly examined, all the contemporary systems show themselves to be of mixed origin.) The first law of intellectual development was ascertained to be the dependence of philosophy on the state of the special sciences. This is now supplemented by other laws, the whole dependence within the "intellectual series" being stated in this form:—Science, philosophy, æsthetic and industrial art constitute a series, each term of which depends on all that precede it. Comte's law of the three states is acutely criticised from the point of view attained.

Le nouveau Mysticisme. Par F. PAULHAN. Paris: F. Alcan, 1891. Pp. 203.

This essay—portions of which have appeared in the *Revue Philosophique* under the same title (see MIND, xvi. 152)—is an attempt to forecast the spirit of the immediate future from indications in the philosophy, science, art, and general social movement of to-day. Marked by a certain contrast to the spirit of the immediate past—individualist and more purely intellectual as this was—the "new spirit" has in common with it the effort after exact scientific knowledge. With this it combines the desire for the ideal, for the marvellous, and for "synthesis" both in theory and practice. A transitional step between the "anarchy" resulting from the earlier movement and the "new mysticism" that is beginning to acquire shape, is the "love of evil"—a phenomenon explicable, as the author thinks, by the anarchy of beliefs, the consequent letting loose of repressed desires, a certain persistence of an older moral or religious ideal, and an individual desire for synthesis; the natural result of this conflux of elements being an inverted ideal. By itself, the "love of evil" would lead only to social decadence, but, as it does not exist alone, it may be taken as one symptom of the preparation for a new order. The author's psychological ability is seen in the details of his analysis.

Premiers Principes Métaphysiques de la Science de la Nature. Par EMMANUEL KANT. Traduits par CH. ANDLER et ED. CHAVANNES. Paris: F. Alcan, 1891. Pp. cxxx., 96.

This, the first French translation of Kant's *Metaphysische Anfangsgründe der Naturwissenschaft*, has already appeared in the *Critique Philosophique* (1888-9). It is now preceded by an extensive introduction, setting forth the principles of Kant's philosophy as applied to natural science not only in the *Metaphysische Anfangsgründe* but in his other works. The introduction is divided into five chapters: (1) Metaphysics of Nature in general, (2) Metaphysics of material Nature, (3) Passage from Metaphysics to Physics, (4) Changes brought about by the *Critique of Pure Reason* in the natural philosophy of Kant, (5) On the relations of Kant and Newton. Kant's great result, according to the authors, is "that there are in necessary phenomena—that is to say, in experience—no more than these three elements: logical thought, mathematical quantity, and the material datum".

Der Positivismus vom Tode August Comte's bis auf unsere Tage (1857-1891). Von HERMANN GRUBER, S.J. Freiburg i. B.: Herder'sche Verlags-handlung, 1891. Pp. viii., 194.

Father Gruber here follows up his excellent treatment of Comte's life and work (see MIND, xv. 143) with a not less noteworthy account of the activity of Comte's disciples, as well as of the wider movement of

modern Positivism in general. The earlier volume gave indications here and there of the later developments of thought now treated at length, but it seemed pretty evident that the author had then his special studies for the present volume still to make. These, as regards the more limited field of Comtist Positivism, are marked by all the characteristics that so favourably distinguished his account of the master. Nowhere else is so clear and comprehensive a statement to be found of the varied labours and aspirations of the Comtists of all countries and of every sect—from the heterodoxy of Littré, through the mild orthodoxy of Lafitte with his English and other following, to the strained orthodoxy of Congreve, in turn surpassed by the fanatical devotion of Lemos and other South American hot-heads. It is when the author turns to deal with the larger Positivism (pp. 104-84) that he becomes a less satisfactory guide. Not that here, too, he has not taken manifest pains with some of the more important thinkers (English, French, German, Italian) and succeeded, on the whole, remarkably well in grouping with them the multitude of minor writers. But, interesting as the exposition is and in many ways valuable, it comes short by omission of all attempt to trace the real origins of that general movement of modern philosophic thought to which Comte contributed little more than a very pertinent name. In the case of particular thinkers, especially German, F. Gruber shows himself well enough aware of the absence of all influence from Comte and presence of other influence (from Kant, &c.); yet the general outcome—or, at least, suggestion—of his inquiry is the more than disputable one, that but for Comte the philosophy of the second half of this century would not have taken on that special relation to empirical fact which the word 'positive' conveys. And the reason of this becomes more and more clear as one reads on: the Jesuit father has all the time a strictly confessional object in view, which is best served by a predominant reference to Comte's personal pretensions. The object is made plain enough long before he asserts and argues in the "Conclusion" (pp. 185-94) that the true Positivism is that which bases upon the three great "facts" of Theism, Christianity, Catholicism. It is revealed in the rather wild denunciation of this or that "freer positivist" which too often takes the place of serious criticism, and takes it the more unfortunately because the Catholic champion can pass a shrewd enough critical judgment when he keeps cool. He loses hold of himself, however, most of all over the Free-mason, between whom and the Positivist he detects a bond as close as it is sinister. But, leaving all that aside, let it be once more said that the work, in general, has great merits. So much, indeed, and so evidently has the author laboured to get command of his subject, that one feels bound to refrain from drawing attention to particular inaccuracies (of a minor sort) which were hardly to be avoided in dealing with so wide a range of thought and thinkers.

Moralphilosophie. Eine wissenschaftliche Darlegung der sittlichen, einschliesslich der rechtlichen Ordnung. Von VICTOR CATHREIN, S.J. Zweiter Band: Besondere Moralphilosophie. Freiburg im Breisgau: Herder'sche Verlagsbuchhandlung, 1891. Pp. xiv., 633.

With this second volume, on Special or Applied Moral Philosophy, the author completes his text-book of Scholastic ethics, of which the General Part was noticed in *MIND*, xvi. 148. The divisions of the present volume are: Div. I. "The Doctrine of individual Duties and Rights". Bk. i. "Man in his relation to God"; bk. ii. "Man in his relation to himself"; bk. iii. "Of the Personal Relations of men with one another";

bk. iv. "Of the right of Property"; bk. v. "Of Contracts". Div. II. "The Social Relations of Man, or Doctrine of Society". Bk. i. "The Family"; bk. ii. "The doctrine of the State"; bk. iii. "The Law of Nations". It is the author's aim to continue the treatment of ethics as before on grounds regarded as accessible to natural reason apart from supernatural revelation; but more definite reference is now made at each stage to the idea of the Church as a supernaturally ordained society. The volume has a practical aim in relation to questions of the day. In connexion with the theory of property there is a long discussion of Socialism; under the theory of the State the relations between State and Church are discussed; and so forth. Polemic with "modern Liberalism" is of course a conspicuous feature of the discussion of practical questions.

Die Bedeutung der theologischen Vorstellungen für die Ethik. Von Dr. WILHELM PASZKOWSKI. Berlin: Mayer & Müller, 1891. Pp. vi., 92.

A sketch of the mutual influence of religious and ethical conceptions, first in the "nature-religions" (religions of India, Egypt, Persia, Greece, Rome, &c.) and then in the monotheistic religions (Judaism, Mohammedanism, Christianity), with some general conclusions as to the relation of the two orders of ideas in the present and future. Religion and morals take their origin, the first from "fear of unknown powers," the second from the social feelings. Soon they begin to influence one another; the gods being regarded to a certain extent as protectors of recognised morals and as having themselves an ethical character. This relation of theological conceptions to ethics does not become perfectly established in any of the "nature-religions," but only in the monotheistic religions, and the religious and moral factors only reach their full harmony in Christianity. In *historical* Christianity this harmony has not been reached, Christian theological conceptions having been injurious as well as serviceable to morals. Here as elsewhere religion has been gradually moralised by rational criticism of its dogmas, and the process may be expected to go on till Christianity becomes wholly ethical and at the same time compatible with scientific knowledge.

Theorie der Gesichtswahrnehmung. Untersuchungen zur physiologischen Psychologie und Erkenntnislehre. Von Dr. ENGELBERT LORENZ FISCHER. Mainz: F. Kirchheim, 1891. Pp. xvi., 392.

Two former works by the author were noticed in MIND, ix. 161. His present *Theory of Visual Perception* is on the same lines; that is to say, it is an attempt at a doctrine consistent at once with Catholic philosophical tradition and with modern physiological and psychological science. The book is divided into four sections, treating respectively of four types of theory: i. "Absolute Objectivism or Extreme Realism" (held by some Neo-Scholastics); ii. "The Subjectivism of Modern Physiology" (Helmholtz, &c.); iii. "The Idealism of Modern Philosophy" (Descartes, Locke, Berkeley, Kant, &c.); iv. "Relative Objectivism or Critical Realism" (the author's own view). The first section is very short (pp. 5-24); the fourth, containing the positive doctrine, takes up about half the book (pp. 197-392). The title has been adopted for brevity; the whole, as the author remarks, would be more exactly described as a contribution to the theory of sense-perception generally, with special reference to visual perception. The bearing of the psychological on the philosophical problem is clearly conceived. In the author's view, "whoever solves the problem of perception has solved the problem of knowledge". His own solution of both problems is

contained in the definition of perception as "the immediate psychical apprehension of an object present to consciousness" (p. 237). He adds the qualification that we do not perceive things as they are in themselves, but as they appear according to the conditions under which we apprehend them sensibly at any particular moment (p. 380). Thus, the objects of sight, for example, are "relative" in that their perception depends on a multitude of conditions outside them; but, though "relative," visual perceptions are not "purely subjective".

Geschichte der Philosophie. Von Dr. W. WINDELBAND, Professor an der Universität Strassburg. Dritte Lieferung. Freiburg i. B.: J. C. B. Mohr (Paul Siebeck), 1891. Pp. 257-384.

In briefly noticing the second instalment of this work (see MIND, No. 62, p. 295), it seemed doubtful whether the author could complete his task—from where he left off, in the heart of Mediæval Philosophy—within his originally projected limits; nor has he, in fact, been able to do so. A fourth instalment of "about six sheets" has still to appear before a definitive judgment can be formed on the result of his novel method of treatment by "questions". The most salient feature of the present instalment is the extension given to "Renaissance Philosophy"—carried forward, in a "physical-science" (after its "humanistic") period, to cover not only Bacon and Hobbes, but also Descartes and Spinoza, and even Leibniz as substantialist. For the present, Prof. Windelband breaks off in the middle of the "Philosophy of the Aufklärung".

Ueber Francis Bacons Formenlehre. Von HANS NATGE, Dr. Phil. Leipzig: B. G. Teubner, 1891. Pp. 82.

A rather elaborate argument for the fundamental position of the doctrine of 'forms' in Bacon's philosophy. Induction, usually regarded as fundamental, derives its whole sense and value from the 'forms'. Form, in Bacon, has a double meaning. It is at once 'essence' or 'concept' and 'law' or 'cause'. Bacon's conception of law and the modern conception are not precisely the same; but the modern character of his thought is seen in this, that for him the configuration and motion of the ultimate particles of bodies constitute the law and also the form of the quality. At the same time it is not to be forgotten that his thought as well as his terminology was modified by surviving Scholasticism.

Ernst Platner als Moralphilosoph und sein Verhältniss zur Kant'schen Ethik. Von PAUL BERGEMANN aus Löwenberg (Schlesien). Halle a. S.: C. A. Kaemmerer & Co., 1891. Pp. 56.

An account of the influence of Kant on the Wolfian, or rather Leibnizian, Platner (1744-1818), especially in ethics. The difference between Platner's earlier ethical views, which are mainly those of the German *Aufklärung*, and his later views formed under Kantian influence, is shown in detail. Even in his later period he did not accept the Kantian formalism, but still upheld "happiness" as giving content to ethical maxims. His criticisms of Kant, as the author shows, were not wanting in point.

Jacob Friedrich Fries als Kritiker der Kantischen Erkenntnistheorie. Eine Antikritik. Von Dr. HERMANN STRASOSKY. Hamburg u. Leipzig: L. Voss, 1891. Pp. 76.

An examination of the modifications made by Fries in Kant's theory of knowledge. While rejecting these—whence the study is called an

"Antikritik" of Fries—the author finds them to be original and stimulating. Remarking on the relation of Fries to Jacobi, he finds that historians of philosophy have taken the wrong view of it in making the philosophy of Fries a combination of positions from Jacobi and Kant. In reality his relation to Jacobi was rather that of a master than of a pupil.

Principien der Ethik und Religionsphilosophie Lotzes. Von G. VORBRÖDT. Ein Gedenkblatt zum 1. Juli 1891, dem zehnjährigen Todestage Lotzes. Dessau u. Leipzig: Rich. Kahle, 1891. Pp. vii., 186.

An attempt to put into systematic shape the ethical and religious philosophy which Lotze did not live to expound in his definitive "System of Philosophy". The divisions of the book are: i. "Ground-questions of theory of knowledge and psychology" (pp. 1-39); ii. "Exposition of Lotze's ethics" (pp. 39-93); iii. "Exposition of Lotze's religious philosophy" (pp. 93-169); with some "Concluding remarks" (pp. 170-183), and a short "Bibliographical Appendix" (pp. 184-6).

Ueber Aufgaben u. Methoden der Psychologie. Von HUGO MÜNSTERBERG. Leipzig: A. Abel, 1891. Pp. 182.

This essay has been primarily issued as pt. ii. (pp. 93-272) of the new series of *Schriften der Gesellschaft für psychologische Forschung*, mentioned in MIND, No. 63, p. 442. It is of like notable quality with the author's *Beiträge*. Space has been readily accorded above (pp. 521-34) to a hostile critic of Dr. Münsterberg's psychological work; and, so far as errors or deficiencies are made out in it, nothing but gratitude is due from all concerned for the pains so strenuously taken. The writer of these lines, who took on himself the responsibility of signalising the importance and freshness of the *Beiträge*, cannot, however, say that his own first opinion of them is seriously affected by Mr. Titchener's criticism—much as there may be in this which Dr. Münsterberg would do well to ponder. The present essay subordinates the question of the Methods to the question of the Problems in a novel and very suggestive way. It is impossible here and now to give even a general indication of the methodological scheme which the author is thus led to frame, but nobody whose business is with psychological science at its present stage of advance can afford to overlook the scheme or its setting.

Nog Eens: Oorsprong en Grenzen der Kennis. Inwijdingsrede uitgesproken op 6 October, 1890, bij de Aanvaarding van het Hoogleerarsambt aan de Rijksuniversiteit te Utrecht, door Jhr. Dr. B. H. C. K. VAN DER WIJCK. [Once More: Origin and Limits of Knowledge. Inaugural Lecture delivered 6th October, 1890, on entering upon the office of Professor in the National University of Utrecht by Chevalier Dr. B. H. C. K. VAN DER WIJCK.] Utrecht, 1890.

When Prof. Opzoomer, the most eminent contemporary philosopher of Holland, was compelled by failing health to retire from the active duties of his chair at Utrecht, it was universally recognised as right and fitting that Prof. Van der Wijck of Groningen, his most faithful and distinguished disciple and follower, should be his successor in the professorship which he had so long adorned. Prof. Van der Wijck's Inaugural Lecture is of itself an adequate justification of his appointment and clear evidence that the great tradition of the chair will be well sustained by its new occupant. But it is also a valuable contribution to the discussion of the fundamental philosophical problem of our time, and it deserves on that account to be studied for its own sake. In

clear, direct and vivid language the new Utrecht professor discusses again the question of the *Origin and Limits of Knowledge*, which had formed the subject of his inaugural lecture when entering upon his public career as professor of philosophy at Groningen, a quarter of a century ago. That period of continued study and active teaching has somewhat modified his acceptance of the external empiricism of Opzoomer's original position from which he started; and the interest of the new inaugural lecture lies mainly in the candour and precision with which a maturer and deeper view is stated in it. The general validity of the theory of the empirical origin and limitation of knowledge is indeed affirmed anew, and its triumph over mere "idle ideal speculation" is emphasised; but it is admitted at the same time that the principle of experience has been advocated in too external and one-sided a way, and that it is necessary so far to adopt the principle of the idealist in order to give an adequate explanation of the origin and nature of human knowledge. In the progress of philosophy the idealists and the empiricists, formerly at opposite poles, have in fact now come nearer each other. "The conflict between experience and speculation is settled in principle. On the one side, it is now recognised that our thinking must have the solid ground of facts under it; and, on the other side, it is now recognised that the power of thinking goes continually beyond experience." While empty ideal speculation is to be abandoned, the scientific thinker has at the same time to acknowledge and appreciate the element of knowledge contributed by the mind itself through its own percipient and intellectual activity. This is the *form* of knowledge, an element which cannot be derived from mere mechanical presentations, or external motions, or material atoms. This formative element includes space and time, the principles of connexion, continuity and unity (Kant's foundations of Pure Physics), objective reflexes of the activity and unity of consciousness. Mental Philosophy has really supplied these fundamental conceptions to Physical Science; and it has been by their aid, and not by mere simple inductions, that the great laws of the indestructibility of matter and force, and of their conservation, have been discovered. But these formal elements of knowledge are merely relative; they only arise out of, and in connexion with the opposition of subject and object; and they only explain the order of the universe in terms of human thought. The origin of human knowledge is thus fully explained, and at the same time its limits are determined. By the aid of such conceptions, and of hypotheses in harmony with them, the range of human knowledge of this kind may be indefinitely enlarged, but its inherent conditions cannot be violated or transcended. There can be no knowledge of an absolutely objective mechanical world of matter or atoms; and it is idle to attempt to explain our subjective experience by mere material atoms and changes. The reality of objective being is a necessity of thought, but we can only construe its nature and relations from our own subjective standpoint. "As we know things only through our consciousness, we know them also only in relation to our consciousness. Our knowledge is so far limited." The significance of all this is obvious. The author himself points out the connexion of his views with those of Kant, Lotze, Fechner, Bain, and Wundt. The Lecture closes with graceful and appropriate references to the relations and circumstances under which it was delivered. It was worthy of its occasion. [W. H.]

ARNOLDI GEULINX Antwerpensis *Opera Philosophica*. Recognovit J. P. N. LAND. Volumen primum. Hagae Comitum apud Martinum Nijhoff, MDCCCXCI. Pp. xx., 506.

This first volume of the collected edition of Geulinx's philosophical

works, announced in Prof. Land's article in *MIND*, No. 62, contains rather less than was then promised (cp. p. 241); but, between the *Quæstiones quodlibeticæ* with the first and second academic *Orationes* on the one hand and the *Logica restituta* with (previously unpublished) supplementary *Dictata* on the other, gives yet a very characteristic representation of the mental quality and range of the ill-fated thinker. It is in the second volume, to follow a year hence, if this can cover (besides what still remains to be given of logical import) the *Ethica* as well as the *Meta-physica*, that his true measure as a philosopher will admit of being taken and his relations both to later and to earlier thought may be rightly appreciated. Already, however, in the first volume, he is seen to put a serious meaning of his own into the forms of the traditional Logic; while the lighter pieces, of which Prof. Land's article gave interesting account, show him possessed, with strenuous intellectual purpose, of a brightness of humour which, one would hope, may have helped him the better to bear the reverses of an all too unfortunate life. In editing the works now given, Prof. Land has spared no pains of collation, so as to make the long-delayed act of reparation the more complete, and also to make the interior worthy of the fine external setting (after the precise model of the memorial edition of Spinoza's *Opp.*) to which he has been helped with the balance of the Spinoza fund. The biographical data, which he has been able after Vander Haeghen (see *MIND*, xiii. 298) to ascertain with probably as much completeness as, in the circumstances of Geulincx's life and end, is now possible, are clearly set out at the beginning; but in place of a portrait (which can never have been taken) we have to be content with three facsimiles of the philosopher's signature. [Occasion may here be taken to correct a mistranslation on p. 240 of Prof. Land's article in No. 62. From line 10, the sentence should run: "They embrace the *Annotata præcurrentia* and *majora* to Descartes' *Principia*, with a collection of theses defended under Geulincx's presidency (1690-1),"—the date, so given, being that of publication. The figures "in 1690-1," as they stood, give a false suggestion.]

RECEIVED also:—

- D. Hack Tuke, *Pritchard and Symonds, with Chapters on Moral Insanity*, Lond., J. & A. Churchill, pp. iv., 116.
 J. M. Sterrett, *Studies in Hegel's Philosophy of Religion*, Lond., Swan Sonnenschein, pp. xiii., 848.
 J. Rae, *Contemporary Socialism*, 2nd ed., Lond., Swan Sonnenschein, pp. xii., 508.
 F. H. Collins, *The Diminution of the Jaw in the Civilised Races, an Effect of Disuse*, Lond., Williams & Norgate, pp. 16.
 E. C. Brewer, *Constance Naden and Hylo-Idealism*, Lond., Bickers, pp. 24.
 W. M. Salter, *What can Ethics do for us?* Chicago, C. H. Kerr, pp. 32.
 P. van Bemmelen, *Le Nihilisme scientifique*, Leide, E. J. Brill, pp. 32.
 F. Hillebrand, *Die neuen Theorien der kategorischen Schlüsse*, Wien, A. Holder, pp. vi., 102.
 J. G. Vogt, *Das Empfindungsprinzip u. das Protoplasma auf Grund eines einheitlichen Substanzbegriffes*, Leipzig, E. Wiest, pp. 208.
 W. Molsdorf, *Die Idee des Schönen in der Weltgestaltung bei Thomas von Aquino*, Leipzig, G. Fock, pp. 47.
 M. Berendt, J. Friedländer, *Spinoza's Erkenntnislehre in ihrer Beziehung zur modernen Wissenschaft u. Philosophie*, Berlin, Mayer u. Müller, pp. xx., 315.
 A. L. Kym, *Ueber die menschliche Seele, &c.*, Berlin: K. Brachvogel, pp. 46.

VII.—FOREIGN PERIODICALS; NOTES.

REVUE PHILOSOPHIQUE.—An. xvi., No. 7. G. Milhaud—La notion de limite en mathématiques. [A "philosophical dialogue," in which the difficulties of one interlocutor are met by a clear statement of the position that everything follows strictly from the notion of limit as defined; the pure mathematician not being concerned with questions as to the correspondence of his results with any given reality.] F. Lannes—Coup d'œil sur l'histoire de la philosophie en Russie (i.). P. Regnaud—Les sources de la philosophie de l'Inde. [The religious conception of the Vedic epoch was that of a *circulus* without end, a perpetual exchange of the elements of life. This found its expression in the sacrifice, regarded as itself an essential part of the universal process. Heaven, with the cosmical or mythical beings which it contains, restores to earth under the form of rain the libation it has received from man by means of the sacrifice. After a time the allegorical sense of the sacrificial hymns remained the only sense that was understood, and a mythology sprang from it which transformed the Vedic religion. The genuine sense beneath the allegory, the idea of an indefinite *circulus* of universal life, lost as essence of the religion, was preserved and prolonged by philosophy.] Analyses, &c. No. 8. G. Mouret—L'égalité mathématique (i.). [An attempt to show, with special reference to the relation of equality, that "the data of mathematics are certain fundamental laws of the mechanical and physical sciences."] L. Arréat—L'hérédité chez les peintres. [Finds in two-thirds out of about 300 cases evidence of "hereditary preparation," and suspects that with further information about the remaining third more would be found.] A. Espinas—La technologie artificialiste (i.). [On the instruments of industry and technical processes in use among the Greeks from the seventh to the fifth century B.C.] A. Bertrand—Un précurseur de l'hypnotisme. [Dr. Pététin of Lyons, whose first memoir was published in 1787; a more extensive (posthumous) work in 1808. A very interesting account is given of his observations and how they came to be made.] Notices bibliog. No. 9. A. Fouillée—Le problème psychologique. [Psychology should not be treated simply from the point of view of intelligence. Primitively mental phenomena are not *representations*, but *appetitions* accompanied by pleasure or pain, consequently *actions* and *reactions*. An argument follows for the explanation by "immanent finality" both in psychology and biology as more profound than mechanical explanations. Against Prof. W. James, M. Fouillée again contends for a feeling of activity of centrifugal origin; and, against others, for a direct appreciation of the intensity of mental states.] A. Espinas—La technologie artificialiste (fin). [The art chiefly discussed is that of medicine as practised by Hippocrates. It is shown to have been an art based on science, and in particular on the naturalistic philosophies of the time.] G. Mouret—L'égalité mathématique (fin). [Further considerations on the conditions of forming an axiom of mathematical equality from observed relations.] Analyses, &c. Notices bibliog. Rev. des Périod.

RIVISTA ITALIANA DI FILOSOFIA.—An. vi. 2, No. 1. F. Cicchitti-Suriani—La scienza dell'educazione nelle Scuole e nelle Riviste italiane. S. Ferrari—La filosofia di Empedocle. A. Chiappelli—Scienze filosofiche e sociali: Relazione sul concorso ai premi ministeriali. L. Ferri—Alcune considerazioni sull'Ecclettismo. Bibliografia, &c.

PHILOSOPHISCHE MONATSHEFTE.—Bd. xxvii., Heft 5, 6. J. Volkelt—Wilhelm Wundt's "System der Philosophie" (i.). K. Ipsen—Die dänische Philosophie des letzten Jahrzehnts. Recensionen, &c. Heft 7, 8. G. Schneege—Goethes Verhältniss zu Spinoza und seine philosophische Weltanschauung (i.). [Goethe's Spinozism was modified by the Leibnizian conceptions of force and independent individuality. His own philosophical view may be called a "dynamical pantheism," involving as it does an "immanent teleology".] J. Volkelt—Wilhelm Wundt's "System der Philosophie" (ii.). Recensionen, &c.

VIERTELJAHRSSCHRIFT FÜR WISSENSCHAFTLICHE PHILOSOPHIE.—Bd. xv. Heft 3. H. Höffding—Psychische u. physische Activität. [A striking defence of the Identity-hypothesis of mind and body in opposition to the objections urged against it, under the name of 'Duplicism,' by the author's colleague, Prof. Kroman, in *Kurzegefasste Logik u. Psychologie* (see MIND, xv. 579).] A. Marty—Ueber Sprachreflex, Nativismus u. Absichtliche Sprachbildung (viii.). C. v. Ehrenfels—Zur Philosophie der Mathematik. H. Schmidkunz—Berichtigung. E. G. Husserl—Die Folgerungs-calcul u. die Inhaltslogik. Anzeige, &c.

PHILOSOPHISCHE STUDIEN.—Bd. vii., Heft 2. A. Lehmann—Kritische u. experimentelle Studien über das Wiedererkennen. [Continuation of the author's essay on Recognition in *Phil. Stud.* v. 96, determined both in its experimental and its critical aspect by Höffding's elaborate rejoinder (in *Viert. f. wiss. Phil.*) to the original essay. The author claims now to have definitively established his former position—that a contiguity-association presupposes neither a similarity-association nor an immediate recognition.] E. W. Scripture—Zur Definition einer Vorstellung. [A well-argued plea for making intellectual unification the specific attribute of *Vorstellung* in all circumstances. The author remarks on the disadvantages of the English 'Presentation' (because of 'Representation') and 'Idea'. Is it past hoping for that 'Notion,' which has lost or never acquired any definite psychological use, might yet become fixed in English as the exact equivalent of *Vorstellung* in all its legitimate applications?] W. Wundt—Zur Frage des Bewusstseinsumfanges. [Defends, against F. Schumann, the consistency of his procedure in *Phil. Stud.* vi. 250 with the doctrine of his *Phys. Psych.*] H. Higier—Experimentelle Prüfung der psychophysischen Methoden im Bereiche des Raumsinnes der Netzhaut. W. Wundt—Eine Replik C. Stumpf's.

ARCHIV FÜR GESCHICHTE DER PHILOSOPHIE.—Bd. iv., Heft 4. P. Tannery—Neuf lettres inédites de Descartes à Mersenne. [Concerned chiefly with mathematical and physical topics. In more than one of them the rising opposition of the Jesuits to the Cartesian philosophy is referred to. There is also interesting mention of the phenomenon of hypnotism in animals.] E. Thomas—Ueber Bruchstücke griechischer Philosophie bei dem Philosophen L. Annaeus Seneca. C. Baumker—Eine bisher unbekannte mittelalterliche lateinische Uebersetzung der *ὑποθέσεις ὑποτιπώσεως* des Sextus Empiricus. J. Freudenthal—Beiträge zur Geschichte der englischen Philosophie. [Continues the study of Everard Digby.] W. Dilthey—Auffassung und Analyse des Menschen im 15. und 16. Jahrhundert. [After general survey, discusses Machiavelli and Montaigne as illustrations of the new types of thought and character produced by revived classical studies.] H. Diels—Neue Fragmente des Xenophanes und Hippon. Jahresbericht (L. Stein, P. Wendland, W. Dilthey, A. Döring, J. Schmidt, B. Erdmann). Neueste Erscheinungen.

ZEITSCHRIFT FÜR PSYCHOLOGIE U. PHYSIOLOGIE DER SINNESORGANE.—Bd. ii., Heft 5. C. Lombroso, S. Ottolenghi—Die Sinne der Verbrecher. [A careful inquiry conducted upon a large number of criminals, "born" as well as occasional, in comparison with normal individuals,—with result that criminals manifest, in general, a deficient sensibility of all kinds except sharpness of vision; one among many points of special interest being the abnormally low development of smell even in sexual criminals. The results are interpreted in the light of, and appear so far to bear out, Lombroso's well-known theory of congenital criminality; they strengthen also the view that moral (as well as intellectual) efficiency has relation to sense-endowment.] G. Engel—Über Vergleichen von Tondistanzen. [Weighty contribution, by a professional musician, to the discussion of the question so hotly disputed by Profs. Stumpf and Wundt over the body of the latter's pupil Lorenz. So far as Prof. Engel takes a side, it is with Stumpf, but he raises also new and important points of his own.]

THE ARISTOTELIAN SOCIETY FOR THE SYSTEMATIC STUDY OF PHILOSOPHY (22 Albemarle Street, W.). At the last meeting of the Twelfth Session, held June 8, a paper was read by Mr. Arthur Boutwood, on "The Philosophy of Rosmini," which was followed by a discussion. The following were elected as members of the Executive Committee for the ensuing session: *President*, Mr. Shadworth H. Hodgson; *Vice-Presidents*, Mr. S. Alexander, Prof. A. Bain, and Mr. G. F. Stout; *Editor*, Mr. Bernard Bosanquet; *Hon. Secretary and Treasurer*, Mr. H. Wildon Carr. The first meeting of next Session was appointed for Monday, Nov. 2, at 8 P.M., when the President will deliver the annual Address. The subject selected is "Matter."

At a Centre for the Extension of University Teaching established for the last four years in Essex Hall, Strand, lectures on Philosophy and Practical Economics have been listened to with keen interest by hard-working students, while popular lectures have proved a failure. As the members of the London Ethical Society desire to establish more systematic teaching in the subjects dealt with at their Sunday evening lectures, they have taken over the management of the Extension-work. The Committee (including, among others, Mr. J. Bonar, Mr. B. Bosanquet, Prof. J. E. Carpenter, and Mr. J. H. Muirhead) has drawn up a scheme of study extending over several years. This commences in October, when Mrs. Bryant, D.Sc. (Lond.), will give a course of lectures on "Mind and Life," and Mr. W. A. Flux, M.A. (Camb.), a course on "First Principles of Political Economy." These courses are intended to be introductory to the more direct treatment of Ethics and Political Philosophy, Philosophy of Art, and History and Philosophy of Religion. The Society hopes also to institute classes on the Theory of Education, the Duties of Citizenship, &c.

Mr. Edmund Sydney Williams (publishing as 'Williams & Norgate') died on 1st September, in his 75th year: truly mourned by one who has had the unfailing benefit of his help and advice in the conduct of MIND.

SPECIAL NOTICE.—MSS. and all other communications for the Editor should now be addressed to Mr. G. F. STOUT, St. John's College, Cambridge.

VALEDICTORY.

Sixteen years ago some words of preface were written on occasion of the first attempt to produce in this country a Philosophical Review, and the time has now come for a few words of conclusion from the same hand. Not that MIND is ending; for (as stated in the July No.) a Second Series of the Review will be begun next quarter, under a co-operative direction that promises a far more effective covering of the ground of Psychology and Philosophy than has hitherto been attained. But the original effort is spent.

That effort, as some know already, has been rendered possible by the public spirit of one man. Why should it not now be openly told, that but for Professor Bain's generous initiative in 1876 this country might still be without a philosophical organ? Let the fact be borne in mind the next time it occurs to anyone to remark on the limitations of homebred English thinking. An English psychologist of the traditional stamp was the first to project, and single-handed has ever been there to sustain, a Review open to all the serious philosophical thought of the country and seeking new lights from the whole world around.

Warm thanks are offered to those who have stood by MIND from the first or later and made its reputation. There is no need to specify here the names that have recurred most frequently in its pages. One exception, however, should be made. Without the help of Mr. Thomas Whittaker, it would not have been possible to furnish the comprehensive survey of each quarter's new literature that has

distinguished the *Review* in its later years. For his (major) share, since 1885, in the anonymous work so done under the heading of 'New Books,' as well as for the qualities he has displayed in signed 'Critical Notices' of works, especially foreign ones, which but for him might never have had their importance made known among us, no editorial acknowledgment is too strong.

The Editor, for his part, is mainly conscious of shortcoming. Its full extent he can himself best measure, knowing all that he had hoped to make of the *Review*; but any reader may have noted, with the years, a gathering tale of promises unfulfilled. For such default, and for the greater that does not in the same way appear, he can but plead the excuse of a struggle with ill-health through most of the sixteen years. In the circumstances, it is perhaps something that *MIND* has never once failed to appear at the appointed time. And as to promises, one at least, given from the beginning, has been amply made good. Though some have been slow to recognise what they did not expect to see, nobody that has followed the course of the *Review* with any attention can now be left unconvinced that *MIND* has all through stood impartially open to writers of every school. If, now and again, frequenters of "the high priori road" have been less vocal in its pages, it is only because they have not chosen to make use of the opportunity of utterance here afforded. The one thing required of writers, with anything of interest or importance to say, has been a knowledge (more or less) of previous thought on their subject. The test, some may think, has not always been very rigidly applied. It has never been applied unequally.

MIND began to appear simultaneously with the '*Revue Philosophique*,' which has ever since been conducted with so much vigour and intelligence by M. Th. Ribot. On neither side was the project of the other known beforehand. There was thus a real significance in the fact that French and English workers were at the same time moved to institute, each, a serial organ for recording the advance of psychological science and for giving expression to the philosophical thought of the day. Till then the work of philosophical journalism had been left mainly to Germany. The English and French *Reviews* came late into the field, but have had an effect without as well as within their respective countries. Very notable is the change that since 1876 has been wrought in Germany.

The older Reviews have given increasing attention to Psychology, and several new serials have come into being, not unstimulated (one may, perhaps, suppose) by the example of MIND and its French contemporary. Only less marked is the advance made in Italy upon the old journalistic activity of Mamiani; while in America (where 'The Journal of Speculative Philosophy' has all the time gone on appearing in its peculiar fashion) two or three new Reviews bear witness to great and growing concern in all that pertains to mental science.

Whatever be the part that MIND may have had in promoting that result, the activity of mental research in other countries is now such that it would have been nothing short of a national reproach if at this time the English Review had been suffered to come to an end. It should thus be matter of congratulation on all sides that there has been found no want of hands ready to keep the flag flying. What conjecture, then, may be hazarded as to the Second Series of MIND from the original Series now ending? It is safe to predict that in all departments of properly philosophical thought the Review will show no falling away from the active interest—not less genuine because mainly practical—that has continued to mark the countrymen of Locke and Berkeley and Hume. Nor is the traditional English work of subjective psychological construction likely to be less effectively represented in its pages than heretofore. But will they prove that this country is at last going to take its fair share in the experimental work which, for the present at least, is the most promising of all the lines of psychological advance? The later volumes of MIND, since the time (1883) when a similar note of interrogation was made, have included a good proportion of experimental research; but it can hardly have escaped attention that it has been contributed mostly from without, by American hands—the same hands that have been or are now organising psychological laboratories over all the breadth of their own land. The interrogatory note is, therefore, still in place. Fortunately, some promise of affirmative answer to it has just come into view. A grant of fifty pounds, by the University of Cambridge, for psychophysical apparatus, with the use of a separate room in the new physiological laboratory there, will not go very far but yet it is a beginning: and the start is made at Cambridge where it not only was first to be looked for but has the best

prospect of being followed up to good purpose. Elsewhere, north or south, academic circumstances are not, for the moment, favourable to the development of the new line of psychological investigation. But, as it is by no accident that Cambridge hands and heads are henceforth to be chiefly responsible for the conduct of *MIND*, there is every reason to expect that the Review will now do much to help on the beginning at last made of provision for a mode of scientific inquiry too long neglected among us.

In another way, also, the coming Series of *MIND* may easily surpass its forerunner. The retiring Editor has had no greater disappointment, throughout the past sixteen years, than in his failure to attach to the service of the Review more than a few of those in this country whose regular business is with Philosophy. To these few his gratitude has already been expressed, including as they do several eminent thinkers whose philosophical activity is not less professional for not being professorial. But the avowed 'professors' are now there in no small number, south as well as north of the Border and in the sister island; and one very marked feature of *MIND* hitherto is the degree to which they have been content to leave the task of filling its pages to the industry or ambition of the lay student. Now in Philosophy there is always room and there should be encouragement for good lay work; but just in Philosophy—where, because of its supreme human interest, anybody may claim to have a voice—is there most need for the critical and directive help of "those who know". The Review must draw to it a larger quantity of expert-work before it can truly become what it has been abroad too readily assumed to be—the faithful and complete representative of all that is best in English thought. It rests now with the body of philosophical instructors to make it such, by a more active interchange, in its pages, of opinion on the subjects occupying their minds from year's end to year's end,—an interchange that would be only the more effective if made as direct and curt and informal as possible. No better wish can be expressed for the next Editor than that he may succeed in commanding a more general and steady support of this kind from his professional brethren than has been the fortune of his predecessor.

GEORGE CROOM ROBERTSON.

